Aethra Gateway

User Guide

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Gateway version 5.0, May 2006

http://www.aethra.com

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About This Manual

The Aethra Gateway User Guide describes how to install, configure and monitor Aethra Gateways.

Related Documentation

The Aethra Gateway documentation set is available on the Aethra Utilities and Documentation CD and includes manuals and online helps. The manuals are available in PDF format.

Note You require Adobe Acrobat Reader version 4.0 or later to open the PDF files. You can download Acrobat Reader free of charge from www.adobe.com.

Conventions Used in this Manual

The Aethra Gateway is sometimes referred to as “the Gateway” throughout this manual.

1

FUNCTIONALITY

This section introduces the Aethra Gateways, and includes the following topics:

- About Aethra Gateway Products
- About Gateway Features
- About Aethra Gateway Applications and Topologies
- About Aethra Gateway Functionality

ABOUT AETHRA GATEWAY PRODUCTS

Aethra Gateway version 5.0, consists of the following products:

- Aethra P20 (see About the Aethra P20)
- Aethra B40 (see About the Aethra B40)

ABOUT THE AETHRA P20

The Aethra P20 Gateway enables audio, video, and data communication between H.320 endpoints that connect through ISDN, and H.323 endpoints that connect through a packet-based network. For voice-over-IP, the gateway enables PSTN voice callers to connect from the ISDN network to IP voice callers. The Aethra P20 supports two PRI ISDN ports.

ABOUT THE AETHRA B40

The Aethra B40 Gateway enables audio, video and data communication between H.320 endpoints that connect through Integrated Services Digital Network (ISDN), and H.323 endpoints that connect through a packet-based network. For voice-over-IP, the gateway enables Public Switched Telephone Network (PSTN) voice callers to connect with IP voice callers. The Aethra B40 Gateway supports up to four BRI ISDN ports.

ABOUT GATEWAY FEATURES

Table 1-1 lists the major features of the Aethra Gateways.

Table 1-1 *Gateway Feature Summary*

Feature	Description
Interoperability	The Gateway provides a high degree of interoperability with other H.323 compliant gateways, gatekeepers, terminals, proxy, and Multipoint Control Unit (MCU) products by being based on the H.320 standard and H.323 protocol stack.
Web-based management	The Gateway features the Gateway interface. This is a web interface used to configure and monitor the Gateway. You can view and modify all aspects of the Gateway configuration from a remote location using a Java-enabled web browser.
SNMP management	The Gateway features Simple Network Management Protocol (SNMP) management that supports all aspects of monitoring, diagnostics, configuration, and trapping.
Diagnostics	The Gateway features front and rear panel LED indicators that display status for the unit. You can also access remote diagnostics of the unit through the Gateway interface, Telnet, SNMP, or a serial port.
Network load balancing	The Gateway supports load balancing on the network by communicating with a gatekeeper through H.323 RAI (Resource Available Indication)/RAC (Resource Available Confirmation) messages.
T.120 data collaboration	The Gateway supports data transfers in calls between ISDN and IP by using high speed T.120 in HMLP and VarMLP formats.
Quality of service (QoS)	The Gateway features configurable coding of media packets to achieve QoS routing priority on the Internet Protocol (IP) network. The Type of Service (ToS) bits of the IP datagram header can be configured for priority level.

Table 1-1 *Gateway Feature Summary (continued)*

Feature	Description
Dial plan	The Gateway supports a simplified dial plan for outbound dialing using a single universal prefix. Using the dial plan, the Gateway automatically detects the capabilities received in the Setup message from the IP endpoint and sets the same bit rate for the ISDN (or serial interface) side of the call.

Direct dialing and call routing	The Gateway dial plan supports the following direct dialing and call routing facilities:
	■ Direct Inward Dialing (DID)
	  ▫ Multiple Subscriber Network (MSN)
	  ▫ Q.931 Sub-addressing Information Element
	■ Internal and External Interactive Voice Response (IVR)
	■ TCS4
	■ Default extension

Access control	The Gateway features password-controlled access to the Gateway interface. Up to ten different administrator access profiles can be defined for the Gateway.
DTMF translation	The Gateway supports translation between in-band Dual Tone Multi-Frequency (DTMF) signals (on the ISDN side) and out-of-band H.245 messages (on the IP side). DTMF translation occurs for voice and video calls.
Dual video	The Gateway supports dual video streams for a single call using TANDBERG Duo Video™ technology. Dual video streams enable a screen to carry video images from one source while simultaneously displaying images from a second source.
Conceal caller ID	The Gateway supports a conceal caller ID feature that instructs the gatekeeper to conceal the identity of the calling endpoint on the IP or ISDN network, whether the presentation restricted feature is enabled or not.

Table 1-1 *Gateway Feature Summary (continued)*

Feature	Description
H.323 fast start	The Gateway H.323 fast start feature enables endpoints to join a voice conference in the Gateway more quickly.
ISDN rollover (available in Aethra P20 only)	The Gateway features ISDN rollover. In this feature, the Gateway sends a “busy out” channel request to the PSTN switch when the current PRI connection is left with less than a predefined number of available B channels. The PSTN switch “rolls over” to the next available gateway.
Network Specific Facility (available in Aethra P20 only)	The Gateway provides support for Network Specific Facility Information Elements (NSF IEs) which enable system administrators to specify to service providers the equipment, service, or network through which they want a call routed.
ISDN connection failure	The Gateway responds to ISDN connection failure events, by unregistering from its gatekeeper. The gatekeeper is forced to send new IP-to-ISDN calls through a different gateway, thus ensuring high call completion rates. The Gateway re-registers to the gatekeeper when the ISDN connection is restored.
Downspeeding	The Gateway features downspeeding functionality. In the downspeeding feature, the Gateway attempts to reconnect a disconnected video call either at a lower bandwidth or as a voice call. Downspeeding contributes to a higher percentage of call completion on the network. The Gateway supports downspeeding at call setup and in mid-call.
Multiple trap server support	The Gateway supports up to three SNMP trap servers.
H.239 support	The Gateway supports the H.239 protocol in ISDN-to-IP calls and in IP-to-ISDN calls.
H.235 encryption for H.323 calls	The Gateway supports H.325-compliant encryption for calls over IP networks.

Table 1-1 *Gateway Feature Summary (continued)*

Feature	Description
H.243 Conference Control support	The Gateway supports the H.243 protocol in ISDN-to-IP calls and in IP-to-ISDN calls. The Gateway identifies the protocol version that an IP endpoint uses and sends H.239 capabilities only to those endpoints working with protocol version 4.0 or later.
Peer-to-peer connectivity	The Gateway supports connectivity to the IP network through a gatekeeper, or directly to a peer device such as Cisco Unified CallManager.
IP network connections	The Gateway has one 10/100Base-T Ethernet IP port (on the front panel) and connects to an IP segment through a direct connection to a network switch.

Table 1-2 lists features for specific Aethra Gateways.

Table 1-2 *Aethra Gateway Feature Specifics*

Feature	Aethra P20	Aethra B40
Supported ports	2 PRI ISDN ports	4 BRI ISDN ports
Supported video conferencing protocols	H.320, H.323 (using Aethra Stack v4.0)	
Supported audio codecs	The term *audio transcoded video calls* refers to the process whereby an *audio* stream in a multimedia call can be transcoded from one codec type to another. Basic and advanced audio coding supported codecs: G.711, G.722, G.722.1, G.723.1, G.728	
Audio Transcoding	G.711 (ISDN) < > G.723.1 (IP) for up to 60 voice channels. G.711 (IP) < > G.728 (ISDN) for up to 20 audio transcoded video channels. The Gateway automatically performs A-Law G.711-to-µ-Law G.711 translation between the IP and ISDN sides if needed.	G.711 (ISDN) < > G.723.1 (IP) for up to 8 voice channels. G.711 (IP) < > G.728 (ISDN) for up to 8 audio transcoded video channels.

Table 1-2 Aethra Gateway Feature Specifics (continued)

Feature	Aethra P20	Aethra B40
	Note When your Aethra unit includes both a Gateway and an MCU, G.728 transcoding is supported on the MCU only.	
Supported video protocols	H.261, H.263, H.263+ (Annexes F, J and N), H.263++ (Annex W), H.264	
Supported video resolutions	VGA, XGA, SVGA, SIF, 4SIF, CIF, QCIF, 4CIF, 16CIF	
Supported bandwidths (Kbps)	56, 64, 112, 128, 168, 192, 224, 256, 280, 320, 336, 384, 448, 512, 672, 768, 1288, 1472, 1680 and 1920	56, 64, 112, 128, 224, 256, 336, 384 and 512
	Note Bandwidth rates of 256 Kbps and up support the G.722 audio codec.	
Call handling capabilities	**For 1 x PRI T1 line:** 23 ports (voice) 23 ports 1B (video and data) 11 ports 2B (video and data) 3 ports 6B (video and data) **For 2 x PRI T1 lines:** 46 ports (voice) 30 ports 1B (video and data) 23 ports 2B (video and data) 7 ports 6B (video and data) **For 1 x PRI E1 line:** 30 ports (voice) 30 ports 1B (video and data) 15 ports 2B (video and data) 5 ports 6B (video and data) **For 2 x PRI E1 lines:** 60 ports (voice) 30 ports 1B/2B (video and data) 10 ports 6B (video and data)	**For 4 x BRI lines:** 8 voice-only calls or 8 video calls or any combination of the two: 1 call x 512 Kbps 1 call x 384 Kbps + 2 calls x 256 Kbps 4 calls x 128 Kbps 8 calls x 64 Kbps

Table 1-2 *Aethra Gateway Feature Specifics (continued)*

Feature	Aethra P20	Aethra B40
Line quality	Supports line echo cancellation, H.323 Fast Start and DTMF detection for voice and video calls.	
IP network connection	I10/100Base-T Ethernet IP UTP connection (on the front panel).	
Serial control port (DB-9) connection	RS-232 DTE 9-pin D-type connection on front panel for connection to a PC terminal or an external modem.	
Supported signaling protocols	5ESS and 4ESS, DMS100, National ISDN, Euro-ISDN, VN6 Dialing (France), NTT (Japan), Hong Kong Dialing (Hong Kong), Support for Taiwan PRI system.	DMS100, National ISDN, 5ESS Custom/Multipoint (US, Taiwan) 5ESS PTP (US, Taiwan) ETSI (France, Europe, Taiwan, Hong Kong) ETSI PTP (France, Europe, Taiwan) VN6 Dialing (France) Austel 1 Dialing (Australia) KDD, NTT (Japan) Hong Kong Dialing (Hong Kong).
PRI interface	Configurable E1/T1 PRI network interface. Support for fractional E1/T1 channel selection. Configurable as terminal side (TE) or network side (NT) device. Configurable Long Haul PRI module (supported in Japan only).	N/A
Switch information	Numbering Plan Identifier (NPI), Type of Number (TON) and Network Specific Facility (NSF) information elements are configurable per PRI port.	N/A
Bonding calls	Internal Imux providing calls at 128 Kbps (2B) up to full PRI of 1472 Kbps (23B) for T1 and up to full PRI of 1920 Kbps (30B) for E1 using bonding mode 1.	Internal Imux providing calls at 128 Kbps (2B) up to 512 Kbps (8B) using bonding mode 1.
	Parallel dialing for bonded calls.	
Internal IVR capacity	30 simultaneous calls	8 simultaneous calls

About Aethra Gateway Applications and Topologies

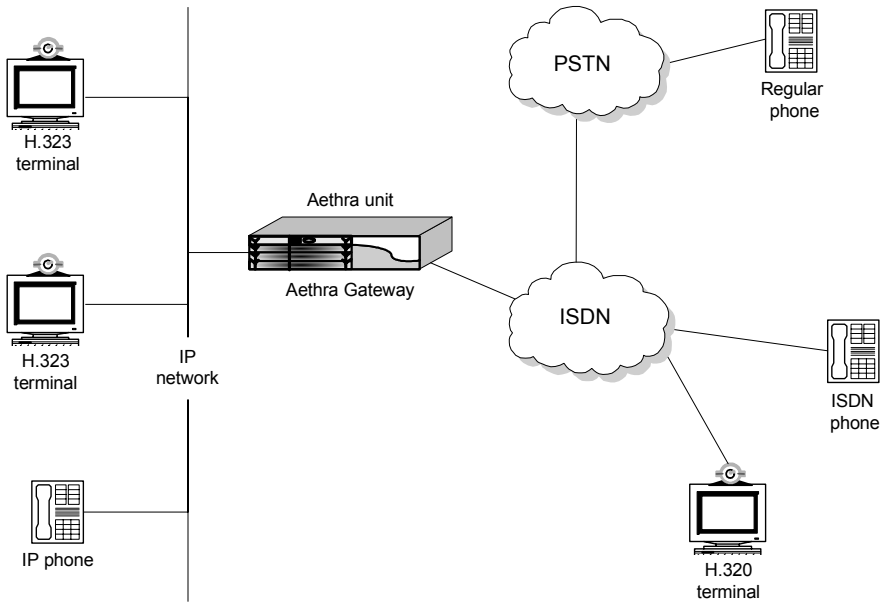
The Aethra Gateway supports multimedia conferencing by translating between H.323 and H.320 protocols. Examples of network applications that use the Gateway include:

- Multimedia conferencing (see About Multimedia Conferencing on page 8)
- Point-to-Point conferencing (see About Point-to-Point Conferencing on page 10)
- Multipoint conferencing (see About Multipoint Conferencing on page 10)
- IP networking (see About Gateway IP Network Connections on page 11)
- ISDN networking (see About Gateway ISDN Network Connections on page 11)

About Multimedia Conferencing

The Aethra PRI gateway and BRI Gateway enable H.323 endpoints on the IP network to communicate with an H.320 terminal, an ISDN phone, or a regular phone on a circuit-switched public network without having to connect directly to these networks. The Gateway allows all IP network terminals to support video conferences without connecting every desktop computer to an ISDN line (see Figure 1-1).

Figure 1-1 *Multimedia Conferencing through the Gateway*



Typical multimedia conferencing applications include:

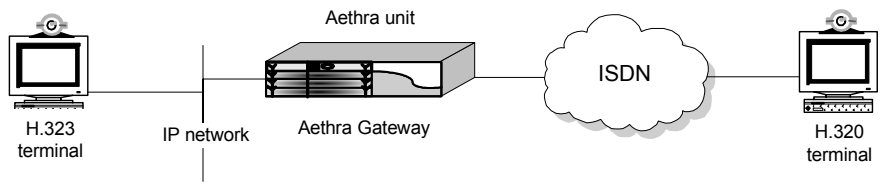
- Business video conferencing
- Distance learning
- Telemedicine
- Video-enabled call centers
- Telecommuting

About Point-to-Point Conferencing

The Aethra BRI Gateway enables direct video, voice, and data communication between an H.320 (ISDN) terminal and H.323 (IP) terminals at bandwidths of up to 512 Kbps (4 BRI lines) using bonding mode 1 (see Figure 1-2).

The Aethra PRI gateway enables direct video, voice, and data communication between an H.320 (ISDN) terminal and H.323 (IP) terminals at bandwidths of up to 1472 Kbps (23B bonding for T1) and up to 1920 Kbps (30B bonding for E1) (see Figure 1-2).

Figure 1-2 *Point-to-Point Conferencing through the Gateway*

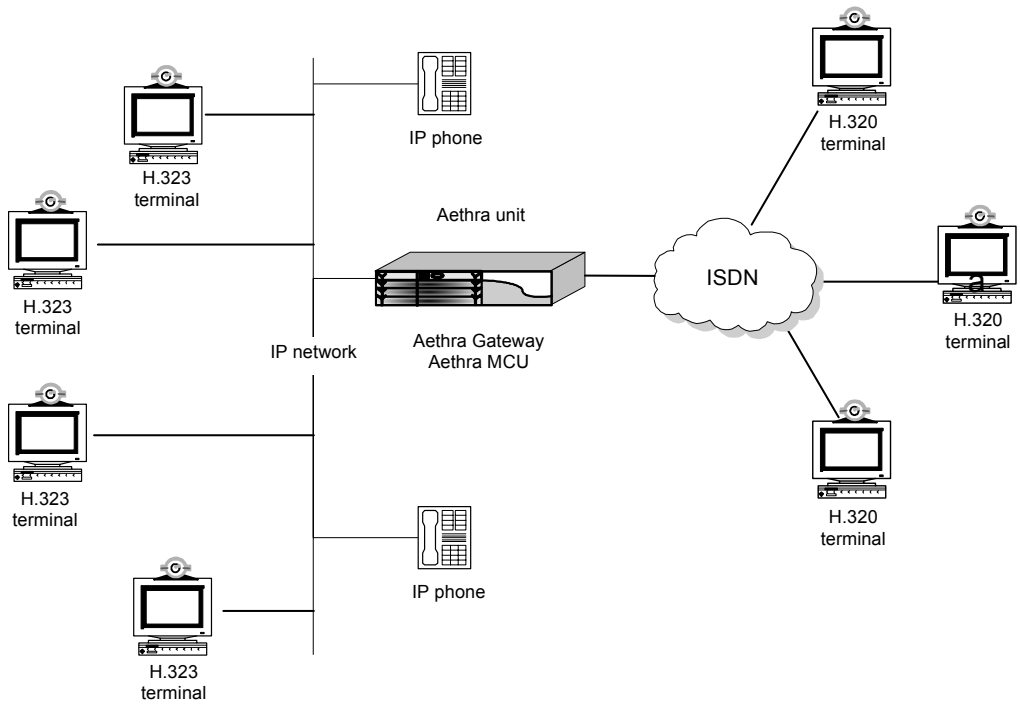


About Multipoint Conferencing

Together with the Aethra MCU, the Aethra PRI gateway and BRI Gateway enable H.320 ISDN terminals to participate in a mixed ISDN-IP multipoint multimedia conference with IP network endpoints (see Figure 1-3).

For example, when an H.320 ISDN terminal wants to participate in a multipoint conference with H.323 IP endpoints, the H.320 ISDN terminal can either join the multipoint conference by dialing to the Gateway, or be invited into the conference by one of the participating IP endpoints. In either case, the Gateway connects the ISDN terminal to the Aethra MCU, enabling it to participate in the multipoint conference.

Figure 1-3 *Mixed ISDN-IP Multipoint Multimedia Conference*



About Gateway IP Network Connections

The Aethra PRI gateway and BRI Gateway feature one 10/100Base-T Ethernet IP port (on the front panel) and connect to an IP segment through a direct connection to a network switch.

About Gateway ISDN Network Connections

The Aethra BRI Gateway features four BRI ISDN connections. Each BRI line provides two B channels and one D signalling channel.

The Aethra PRI gateway features configurable E1/T1 PRI ISDN connections. When configured as an E1 connection, each port provides 30 B channels and one D signaling channel. When configured as a T1 connection, each port provides 23 B channels and one D signaling channel. The type of line available depends on your local ISDN provider. You configure the Gateway PRI port to an E1 or T1 interface accordingly. In addition, you can choose to activate only specific channels by using fractional channel selection.

PRI GATEWAYS

You can connect the PRI gateway directly to a PRI line provided by your local ISDN provider (as shown in Figure 1-4), or to a local private branch exchange (PBX) that provides the PRI connection (as shown in Figure 1-5).

Figure 1-4 *Connecting the PRI Gateway Directly to a Central Office Switch*

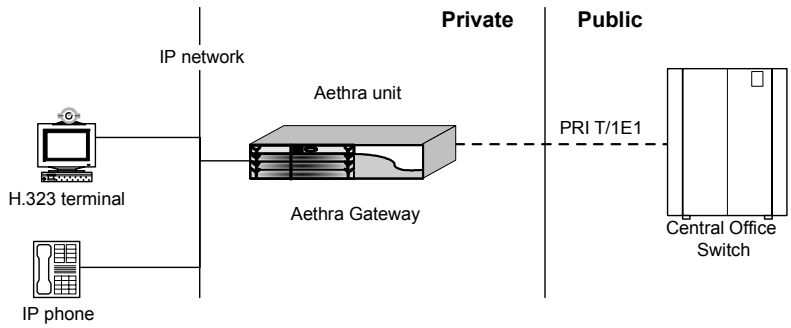
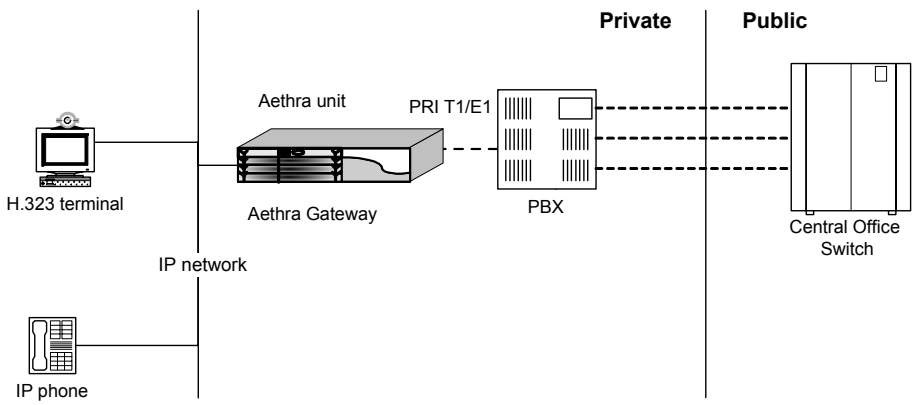


Figure 1-5 *Connecting the PRI Gateway to a PBX that Provides a PRI Line*



BRI GATEWAYS

You can connect the BRI Gateway to a local private branch exchange (PBX) that provides the BRI connection (as shown in Figure 1-6), or to a public phone network using an NT1 device (as shown in Figure 1-7).

Figure 1-6 *Connecting the BRI Gateway Directly to a PBX that Provides a BRI Line*

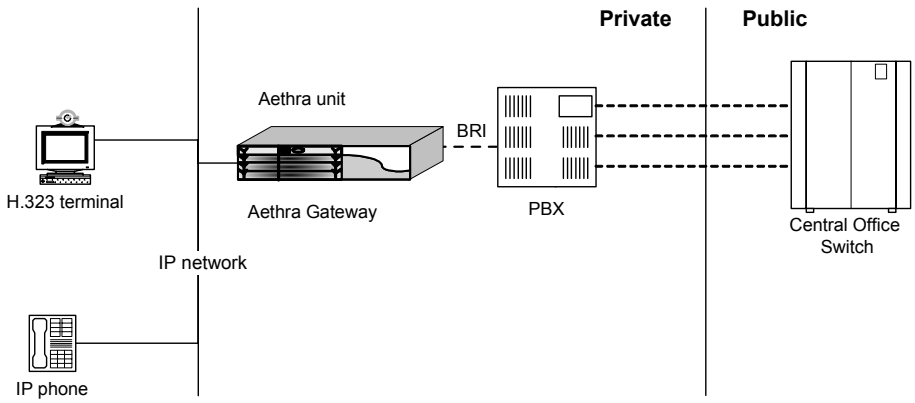
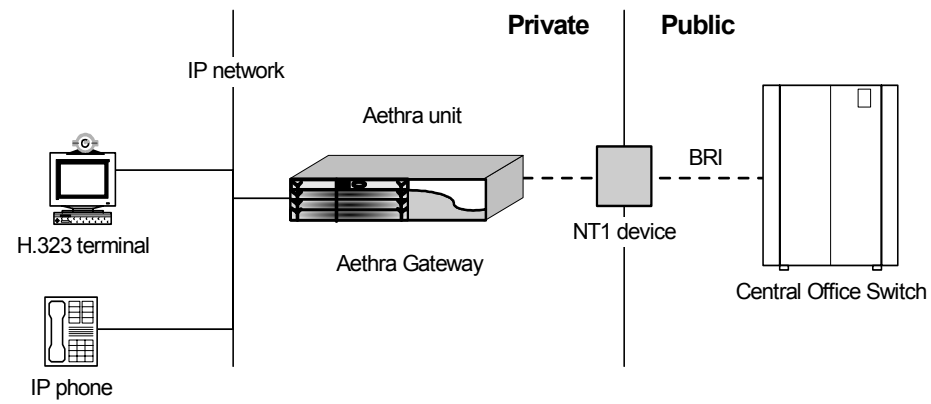


Figure 1-7 *Connecting the BRI Gateway Directly to a Central Office Switch*



About Aethra Gateway Functionality

This section discusses the following topics:

- About PRI Gateway Call Handling Capacity on page 14
- About Gateway Call Bandwidth Overhead on page 15
- About Peer-to-Peer Connectivity on page 16

About PRI Gateway Call Handling Capacity

Table 1-3 lists the maximum call handling capacity of the PRI gateway for different types of calls.

Table 1-3 *PRI Gateway Call Handling Capacity*

Call Type	Maximum Number of Calls Using 1 x E1 PRI Line	Maximum Number of Calls Using 1 X T1 PRI Line	Maximum Number of Calls Using 2 x E1 PRI Lines	Maximum Number of Calls Using 2 x T1 PRI Lines
voice (64 Kbps)	30	23	60	46
2B video (128 Kbps)	15	11	30	23
6B video (384 Kbps)	5	3	10	7
12B video (768 Kbps)	2	1	5	3

Note Enabling ISDN-to-IP DTMF detection in the PRI gateway for video calls reduces the number of supported calls by half.

About BRI Gateway Call Handling Capacity

Table 1-4 lists the maximum call handling capacity of the BRI Gateway for 4 x BRI lines, 8 voice-only calls, or 8 video calls, or any combination of the two.

Table 1-4 *BRI Gateway Call Handling Capacity*

Number of Calls	Capacity
1	384 Kbps+ or 412 Kbps
2	256 Kbps
4	128 Kbps
8	64 Kbps

About Gateway Call Bandwidth Overhead

According to the H.320 standard, the available bandwidth allocated to a call at any given bit rate will always be slightly less than the stated maximum for the following reasons:

- All stated maximum call bandwidths include provision for control, audio, video, and data traffic.
- Video traffic on the ISDN side contains additional bits for error correction purposes which also consume bandwidth. Video traffic on the IP side does not include this additional load.
- Opening an audio channel further reduces the bandwidth available to the video traffic.

For example, a call at 384 Kbps actually has only 363 Kbps available to it. Control and error correction account for the remaining 21 Kbps.

Resource Allocation across E1/T1 Lines

The Gateway can allocate bandwidth resources to calls across separate E1 or T1 connections to maximize bandwidth capacity in cases where there is not enough capacity for a call on a single E1 or T1 connection, but where sufficient capacity does exist when remaining capacity on both E1/T1 lines is combined.

For example, a Gateway using two T1 lines can support three 6B calls on each T1 line, with 320 Kbps spare capacity per line:

- Each T1 line provides 23 B channels.
- Each B channel supports 64 Kbps
- Each T1 line supports 23 x 64 = 1472 Kbps
- Each 6B call requires 6 x 64 = 384 Kbps
- Each T1 line supports 1472/384 = 3 6B calls + 320 Kbps spare

The Gateway processes an additional 6B call requiring a further 384 Kbps by taking bandwidth resources from each of the two T1 lines, both of which have 320 Kbps available. In this way, the Gateway spreads the call over both T1 lines.

About Peer-to-Peer Connectivity

The Gateway supports the following types of connectivity to the IP network

- Through a gatekeeper
- Directly to a peer device such as Cisco Unified CallManager without the need for a gatekeeper.

2

SETTING UP YOUR AETHRA GATEWAY

This section introduces the Aethra MCU solution and details the components that Aethra MCU includes, and includes the following topics:

- Physical Description
- Preparing for Installation
- Verifying the Package Contents
- Mounting the Aethra Gateway Unit in a 19-inch Rack
- Aethra Gateway Unit Initial Configuration
- Connecting the Aethra Gateway Unit to the LAN
- Managing and Monitoring the Aethra Gateway Unit
- Accessing the Aethra Gateway Administrator Interface
- Registering the Online Help

PHYSICAL DESCRIPTION

This section provides a physical description of the Aethra Gateway units.

FRONT PANEL

Figure 2-1 shows the front panel of the Aethra Gateway unit. Table 2-1 describes the components of the front panel.

Figure 2-1 *Aethra Gateway Front Panel*

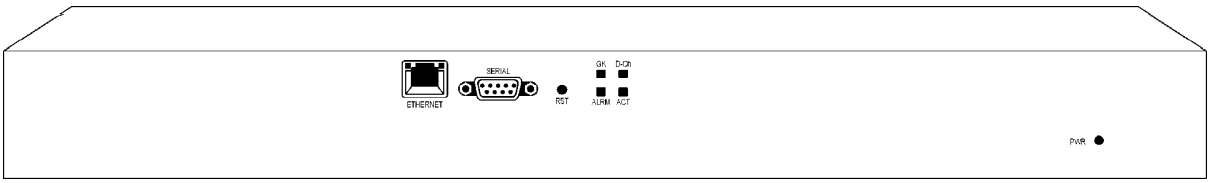


Table 2-1 *Front Panel Components*

Component	Description
ETHERNET connector	An RJ-45 connector that provides the primary Ethernet connection for the Aethra Gateway IP network port.
SERIAL connector	A DB-9 connector that allows you to connect a PC terminal to the Aethra Gateway unit for local configuration.
RST button	Allows you to reset the Aethra Gateway unit manually.
GK LED	Lights green when the Aethra Gateway unit is registered with a gatekeeper.
D-Ch LED	Lights green when a PRI or BRI line is enabled and a carrier signal is detected
ACT LED	Lights green to indicate that there are active calls in the Aethra Gateway unit.
ALRM LED	Lights green to indicate that an error has occurred and the Aethra Gateway unit requires resetting.

Table 2-1 Front Panel Components (continued)

Component	Description
Ethernet LEDs	The top part of the Ethernet connector contains two LED indicators. The left-hand LED lights green when the local IP network link is active. The right-hand LED lights green if the connection speed is 100 Mbps, and is off when the connection speed is 10 Mbps.

AETHRA P20 REAR PANEL

Figure 2-2 shows the rear panel components of the Aethra P20 unit. Table 2-2 describes these components.

Figure 2-2 Aethra P20: Rear Panel

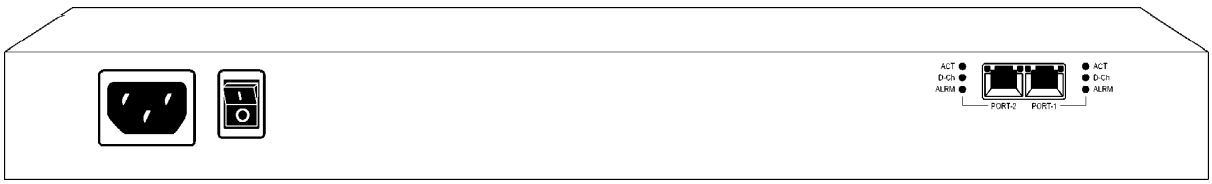


Table 2-2 Aethra P20 Rear Panel Components

Component	Description
ACT LEDs	Lights green to indicate that there are active calls in the Gateway on the specified PRI line.
D-Ch LEDs	Lights green to indicate that the PRI line is enabled and a carrier signal is detected.
ALRM LEDs	Displays alarm events for the PRI line. ■ YELLOW—Lights yellow when there is a loss of frame alignment at the remote side. ■ ORANGE—Lights orange when there is a loss of frame alignment in the Gateway.
PRI LINE connectors	RJ-45 connectors that provide the PRI line connections for the specified Gateway ISDN PRI port.

AETHRA B40 RTM

Figure 2-3 shows the rear panel components of the Aethra B40 unit. Table 2-3 describes these components.

Figure 2-3 *Aethra B40: Rear Panel*

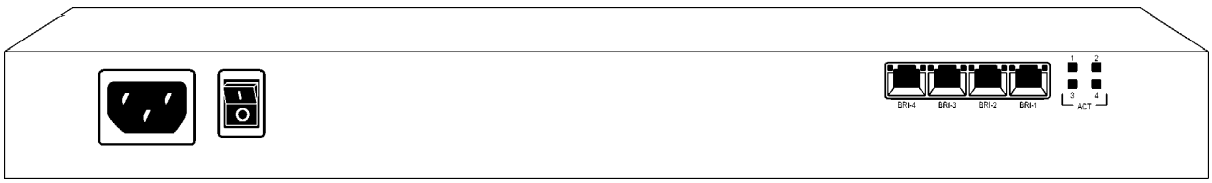


Table 2-3 *Aethra B40 Rear Panel Components*

Component	Description
ACT LEDs	Lights green to indicate that there are active calls in the Gateway on the specified BRI line.
BRI LINE connectors	RJ-45 connectors that provide the BRI line connections for the specified Gateway ISDN BRI port.

PREPARING FOR INSTALLATION

This section describes the requirements for installing the Aethra Gateway unit.

- Proper clearance at the sides of the unit to allow adequate ventilation, and at least 20 cm clearance at the back of the unit to allow access to cable connections
- PC with a serial port and terminal emulation software to assign the Aethra Gateway unit an IP address
- Dedicated IP address for the Aethra Gateway unit
- IP address of the router that the Aethra Gateway unit will use to communicate across the network
- For an H.323 environment, IP address of the H.323 gatekeeper with which you want the Aethra Gateway unit to register
- Available IP network ports on the switch for the Aethra Gateway unit
- A grounded AC power outlet
- 10BaseT or 100BaseT LAN cable
- Ambient room temperature range of 32^{o} to 104^{o}F (0^{o} to 40^{o}C)
- Non-condensing relative humidity range of 5% to 90%

Verifying the Package Contents

Inspect the contents of the box for shipping damage. Report any damage or missing items to your distributor or reseller. Table 2-4 lists the package contents for the Aethra Gateway unit.

Table 2-4 *Package Contents with Aethra Gateway Unit*

Product	Contents
Aethra P20 or Aethra B40 unit	■ Aethra Gateway Unit ■ Power cable (depending on customer location) ■ Terminal cable ■ LAN cable ■ Rack mounting kit (two brackets and six screws) ■ Four rubber feet ■ Aethra Gateway User Guide (in PDF format only) ■ Aethra Gateway Quick Start ■ Aethra Gateway Release Notes ■ Utilities and Documentation CD-ROM containing product documentation, utilities and online help files.

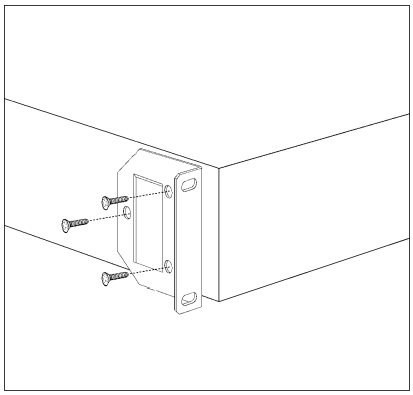
Mounting the Aethra Gateway Unit in a 19-inch Rack

You can optionally mount the Aethra Gateway unit in a standard 19-inch rack. Two mounting brackets and a set of screws are included in the Aethra Gateway unit shipping box.

Procedure

1. Disconnect all cables including the power cables.
2. Place the Aethra Gateway unit right-side up on a hard flat surface, with the front panel facing you.
3. Position a mounting bracket over the mounting holes on each side of the Aethra Gateway unit, as shown in Figure 2-4.

Figure 2-4 *Fitting a Bracket for Rack Mounting*



4. Pass the screws through the brackets and tighten them into the screw holes on each side of the Aethra Gateway unit using a suitable screwdriver.
5. Insert the Aethra Gateway unit into the 19-inch rack.
6. Fasten the brackets to the side rails of the rack.
7. Make sure that the air vents at the sides of the Aethra Gateway unit are not blocked.

AETHRA GATEWAY UNIT INITIAL CONFIGURATION

Initial monitoring and administration of the Aethra Gateway unit are performed from a remote PC via a serial connection. This allows you to access the boot configuration menu of the Aethra Gateway unit. At power-up, the Aethra Gateway unit goes through the following boot phases:

- **Auto-boot**—The embedded operating system initializes and displays basic information.
- **Configuration menu**—A 6-second countdown allows you to enter the configuration menu.

- **Initialization**—The Aethra Gateway unit completes its boot sequence and is ready for operation.

Note You can perform serial port configuration of the Aethra Gateway unit only at startup, during a short period indicated by a 6-second countdown. Once the initialization phase is complete, the only way you can access the configuration menu is by restarting the Aethra Gateway unit.

CONNECTING TO A PC

This section describes how to use the serial port connection to configure the Aethra Gateway unit with an IP address.

Procedure

1. Locate the terminal cable shipped with the Aethra Gateway unit.
2. Connect the end labeled **PC** to the serial port on the computer.
3. Connect the end labeled **Unit** to the serial port connector on the Aethra Gateway unit front panel.

Note The PC terminal should have an installed terminal emulation application, such as HyperTerminal.

SETTING THE IP ADDRESS

This section describes how to use the serial port to configure the unit with an IP address and other address information.

The serial port on the Aethra Gateway unit front panel is used to assign a new IP address to your Aethra Gateway unit. You must assign the IP address before you connect the Aethra Gateway unit to the network.

Before You Begin

Gather the items listed in Table 2-5 to assign an IP address to the Aethra Gateway unit.

Table 2-5 Requirements for Setting the IP Address

Requirements	Notes
Dedicated IP address for the Aethra Gateway unit	
IP address of the default router the Aethra Gateway unit uses to communicate over the network	
PC with available serial port and terminal emulator software installed	
RS-232 terminal cable (shipped with the unit)	

Procedure

1. Connect the supplied terminal cable to the PC terminal.
2. Connect the power cable.
3. Start the terminal emulation application on the PC.
4. Set the communication settings in the terminal emulation application on the PC as follows:
   - Baud rate: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None
5. Turn on the power to the Aethra Gateway unit.

6 After the terminal emulator session starts, press the **RST** button on the Aethra Gateway unit front panel to reset the module.

A log of the auto-boot events and a VxWorks banner scrolls across the computer monitor.

Note When the Aethra Gateway unit is started for the first time, two VxWorks banners appear. The configuration option appears after the second banner.

---

7 When the message "Press any key to start configuration" appears on the screen, press any key within 6 seconds.

The **Network Configuration** menu displays:

```
Press any Key To start configuration...
6
Enter <N> to configure default network port values
Enter <P> to change the configuration software password
Enter <A> to display advanced configuration menu
Enter <Q> to quit configuration menu and start GW
```

Caution If you do not press a key before the countdown ends, the device continues its initialization and you can only configure the device by pressing the **RST** button on the front panel.

---

8 At the prompt, type **N** to configure default network port values and press **Enter**.

9 At the Enter IP address for default interface prompt, type the IP address you want to assign to the Aethra Gateway unit and press **Enter**.

Caution Do not use leading zeros in the IP address.

---

10 At the Enter Default Router IP Address prompt, type the IP address of the router associated with the segment in which the unit will be installed and press **Enter**.

Caution Do not use leading zeros in the IP address.

11 At the Enter IP Mask <HEX> for default device prompt, type the subnet mask as follows:

- Convert the subnet mask IP address to hexadecimal notation, type the hexadecimal number at the prompt, and press **Enter**.

  For example, for the subnet mask 255.255.255.0 the hexadecimal value you type is FFFFFF00.

Note You can use the computer's desktop calculator to convert the subnet mask ID to hexadecimal notation.

- If a subnet mask is not used, press **Enter**.

12 Allow the unit to complete the reboot process. A new emulator session begins.

13 Close the terminal emulator session.

Changing the Configuration Tool Login Password

You can use the terminal emulator to change the default password of the default login user before others can use the Aethra Gateway interface.

Procedure

1 Start a terminal emulator session for the Aethra Gateway unit.

2 Press the **RST** button on the front panel of the Aethra Gateway unit.

After 60 seconds, a new terminal emulator session begins on the computer monitor.

3 After the second VxWorks banner scrolls across the screen, the following message appears: “Press any Key to start the configuration.”

4 Press any key and then press **Enter**.

The default network properties screen appears.

5 At the prompt, enter **P** and press **Enter** to select “change the configuration software password.”

The “**Enter user name”** prompt appears.

6 Enter the user login name for which you want to change the password and press **Enter**.

The default user name is admin. This is the user name that allows you to access the Aethra Gateway interface.

The Enter new password prompt appears.

7 Enter the password you want the user to use to log in to the Gateway interface and press **Enter**.

There is no default password.

8 The configuration menu re-appears.

9 Enter **Q** and press **Enter** to exit.

CONNECTING THE AETHRA GATEWAY UNIT TO THE LAN

This section describes how to connect the Aethra Gateway unit to the Local Area Network (LAN).

Procedure

1 Connect the supplied LAN cable from your network hub to the 10/100BaseT Ethernet port on the front panel of the Aethra Gateway unit. The 10/100BaseT port accepts an RJ-45 connector.

2 Connect a separate ISDN or serial line to each PRI or BRI port in the rear panel of the Aethra Gateway unit. The port accepts an RJ-45 connector.

Managing and Monitoring the Aethra Gateway Unit

You can manage and monitor the Aethra Gateway unit locally or from remote connections. You can also upgrade Aethra Gateway software.

SNMP Management

The Aethra Gateway unit is equipped with an SNMP agent. You can access the Aethra Gateway unit using an SNMP management client.

Local Port Monitoring Connections

You should access the Aethra Gateway unit using a local port connection for preliminary configuration and monitoring.

Serial Port

The Aethra Gateway unit includes a DB-9 serial port connector and an RJ-45 serial port connector. The DB-9 serial port is used to access the boot sequence menu from a local PC. Using a terminal emulation application running on the PC, you can assign an IP address and subnet mask to the Aethra Gateway unit.

The RJ-45 serial port is used to connect a PC terminal to the Aethra Gateway unit.

Note A special adapter cable for connecting between a standard DB-9 serial cable and the RJ-45 serial port is supplied with the Aethra Gateway unit.

SVGA Port

The Aethra Gateway unit is equipped with an SVGA port for connecting to a standard PC monitor screen. The SVGA port allows you to view the operating system desktop and to monitor the applications that are active on the desktop.

Performing Software Upgrades

You can perform software upgrades by using the Aethra Upgrade Utility to upload files via a network or modem connection to the Aethra Gateway unit. For more information, see the Using the Aethra Software Upgrade Utility chapter.

ACCESSING THE AETHRA GATEWAY ADMINISTRATOR INTERFACE

The Aethra Gateway Administrator is a web interface that allows you to configure general Aethra Gateway unit settings, monitor Aethra Gateway unit operation, create or edit services and perform maintenance.

You access the Aethra Gateway Administrator web interface in the Aethra Gateway unit access window by signing in as an Administrator.

You can use your web browser from any remote PC station to monitor and to configure the Aethra Gateway unit. A web server is installed in the Aethra Gateway unit to facilitate the use of the remote web-based monitoring and management.

Access to the Aethra Gateway configuration interface is controlled by a user name and a password. Once you have entered the settings you want, you should upload them to the unit for them to take effect, or you can save them to a configuration file to be loaded at a later time.

Before You Begin

The following requirements are necessary to access the Gateway Administrator web interface:

- A Java-compliant browser. Microsoft Internet Explorer version 5.5 or later is recommended.
- The Aethra Gateway unit IP address or a web link to the Aethra Gateway unit.
- Administrator level-access
- The required user name and password.

Note For first-time installation, you must assign an IP address to the Aethra Gateway unit using a serial port connection before you can access the web interface. For more information, see Setting the IP Address on page 23.

Procedure

1. Launch your browser and type the IP address or the name of the Aethra Gateway unit.

   For example, **http://125.221.23.44** or **board_name**.

   The Aethra Gateway login page appears.

2 Type the Administrator user name and password in the appropriate fields and click **Login**. The default global user name is *admin*. The default password is <null>.

The Gateway Administrator interface appears.

Note If you try to sign in as an Administrator and another Administrator is currently signed in, the Aethra Gateway signs you in as a **Read only** user and the words *Read Only* appear at the top of the window. **Read only** users cannot edit any of the Aethra Gateway settings.

REGISTERING THE ONLINE HELP

The online help files for the Aethra Gateway Administrator interface are shipped on the Aethra Utilities and Documentation CD-ROM. To use the online help, you must install the help files for the appropriate Gateway in a shared directory on your network and register the directory location in the Administrator interface.

Procedure

1 Ensure that you have installed the online help library from the Aethra Utilities and Documentation CD-ROM on your PC.
2 Open a Java-compliant web browser and access the Aethra Gateway Administrator web interface.

The Administrator login page appears.

3 In the **Name** field, type you user name.
4 In the **Password** field, type your password.
5 Click **Go**.
6 On the sidebar, click **Device**.
7 Click the **Web** tab.
8 In the **Online Help URL** field, type the path to the directory in which the MCU online help files that you want to use are stored as follows:
   - If the directory is located on a file server, type:
     file://.../shared_directory_name /program_folder

- If the directory is located on a web server, type:
  http://.../shared_directory_name /program_folder

9 On the toolbar, click **Upload**.

NETSCAPE NAVIGATOR USERS

Online help files located on the local network and accessed using Netscape Navigator 4.x must be located on a mapped network drive.

3

CONFIGURING THE AETHRA GATEWAY

This section describes what you can configure and how to configure Aethra Gateways, and includes the following topics:

- About Gateway Interface Users
- Viewing LED Information
- Viewing General Information About the Gateway
- Viewing Address Settings
- Changing the Administrator Interface Web Server Port
- Configuring Security
- About the Gateway Administrator Interface
- Viewing the Status Tab
- Configuring Gateway Settings
- About Gateway Services
- Configuring Port Settings
- Viewing Call Information
- Viewing Gateway Alarm Events
- Viewing Gateway Statistics
- Configuring Gateway Maintenance Tasks
- Saving Configuration Settings
- Importing Configuration Files

About Gateway Interface Users

Users must have the appropriate access level to log in to the Gateway interface. With Administrator-level access, a user can configure the Gateway and monitor Gateway activity. You can view and manage the list of Gateway users in the **Users** tab of the **Device** section of the Gateway interface. The **Users** tab displays all currently configured users and their access levels.

There are three types of Gateway interface users:

- **Administrator**—Full access to the Gateway interface to configure Gateway settings.
- **Operator**—User can monitor or disconnect calls but otherwise only has read-only access to the Gateway interface.
- **Read-only**—User has read-only access to the Gateway interface.

Adding Gateway Interface Users

In the **Users** tab of the **Device** section of the Gateway interface, you can add Gateway interface users.

Procedure

1. In the Gateway interface, on the sidebar, click **Device**.
2. Click the **Users** tab.
3. Click **Add** to add a new user.

   The **Add User** dialog box appears.
4. In the **User name** field, enter the user login name.
5. In the **Access Level** field, choose one of the following access levels: **Administrator**, **Operator** or **Read only**.
6. In the **Password** field, enter the password that the user uses to login to the Gateway interface.
7. In the **Confirm Password** field, re-enter the password.
8. Click **Upload**.

Editing Gateway Interface Users

In the **Users** tab of the **Device** section of the Gateway interface, you can edit Gateway interface users.

Procedure

1. In the Gateway interface, on the sidebar, click **Device**.
2. Click the **Users** tab.

3 Select an existing user and click **Edit**.

The **Edit User** dialog box appears.

4 In the **User name** field, edit the user login name.

5 In the **Access Level** field, choose one of the following access levels: **Administrator**, **Operator** or **Read only**.

6 In the **Password** field, edit the password that the user uses to login to the Gateway interface.

7 In the **Confirm Password** field, re-enter the password.

8 Click **Upload**.

Deleting Gateway Interface Users

In the **Users** tab of the **Device** section of the Gateway interface, you can delete Gateway interface users.

Procedure

1 In the Gateway interface, on the sidebar, click **Device**.

2 Click the **Users** tab.

3 Select a user and click **Delete**.

Viewing LED Information

In the **LED Monitoring** tab in the **Device** interface, you can monitor the status of all the Gateway front and rear panel LED indicators. The LEDs are displayed in diagrams reproducing the layout of the Gateway front and rear panels.

Procedure

1 In the Gateway interface, on the sidebar, click **Device**.

2 Click the **LED Monitoring** tab.

3 Place the mouse cursor over the required LED in the **LED Monitoring** tab to view a description of that LED.

VIEWING GENERAL INFORMATION ABOUT THE GATEWAY

In the **Basics** tab in the **Device** interface, you can view and configure general information about the hardware and software the Gateway uses.

Procedure

1. In the Gateway interface, on the sidebar, click **Device**.
2. Click the **Basics** tab.

   Table 3-1 describes the elements that appear in the **Basics** tab.

Table 3-1 *Device Basic Tab Elements*

Field	Description
Device name	Identifies the model number of the device.
Location	User-configured description about the device. Click this field to type a new description, and then click **Upload** on the toolbar.
Serial number	The serial number that the factory assigned to the device.
License key	Your Aethra license key for accessing Aethra Gateway devices. Click the **Update** button to modify your Aethra license key.
Hardware version	The version number of the current hardware configuration.
Software version	The first two digits of the version number of the software installed on the device. Click the **Details** button to view details of the versions of software components installed on the device.
Date/Time	The date and time that the Aethra Gateway clock reports.

Related Topics

- Updating Your License on page 37
- Viewing Software Version Details on page 37
- Setting the Time and Date on the Gateway on page 37

- Setting the Gateway Location on page 38
- Resetting Default Device Basic Settings on page 39

Updating Your License

You use the **Basics** tab to update your Gateway license.

Procedure

1. On the sidebar, click **Device**.
2. Click the **Basics** tab.

   The **Licensing and Registration** dialog box appears.
3. Access the Aethra web site to register before requesting a new license key by clicking the **Click here to register at the web site** link, or by copying the URL that appears in the lower half of the screen into your browser.
4. Type your new license key in the **New license key** field and click **Upload** to activate the new license key.

Viewing Software Version Details

You use the **Basics** tab to view expanded software version information.

Procedure

1. On the sidebar, click **Device**.
2. Click the **Basics** tab.
3. Locate the **Software version** field and click **Details**.

   The **Version Details** dialog box appears.

Setting the Time and Date on the Gateway

You use the **Basics** tab to choose how your Gateway tracks the date and time.

Procedure

1. On the sidebar, click **Device**.
2. Click the **Basics** tab.

3 Locate the **Date/Time** field and click **Change**.

The **Change Time** dialog box appears. The date and time the Gateway reports appear in the **Set time to** field.

4 In the **Change** field, select the unit of time that you want to change.

Note There is no unit to change AM and PM. This designation rolls automatically when the hour rolls past 12 backward or forward. Similarly, seconds roll minutes, minutes roll hours, hours roll days, and days roll months.

5 In the **Set time to** field, choose the up or down arrow to change that unit.

The unit you choose changes in the direction you choose: higher (up) or lower (down).

6 Repeat step 4 and 5 for as many units as you want to change.

7 On the toolbar, click **Upload**.

SETTING THE GATEWAY LOCATION

You can install the Gateway anywhere on your network including at a remote site. In the **Basics** tab, you can describe the current location of the Gateway.

Procedure

1 On the sidebar, click **Device**.

2 Click the **Basics** tab.

3 In the **Location** field, enter the location information about the Gateway that you want to display.

The field displays up to 23 characters.

4 On the toolbar, click **Upload** to save to configuration memory.

Resetting Default Device Basic Settings

In the **Basics** tab, you can restore board basic settings to factory defaults.

Procedure

1. On the sidebar, click **Device**.
2. Click the **Basics** tab.
3. Select the **Reset to default settings** check box.

Viewing Address Settings

In the **Addressing** tab, you can view address information for the Gateway such as IP address informations, Domain Name Server (DNS) information and Ethernet port speed and duplex. Table 3-2 describes the elements that appear on the **Addressing** tab.

Table 3-2 *Addressing Tab Elements*

Field	Description
IP Address	
IP Address	The IP address assigned to the Gateway.
Router IP	The address of the router that the Gateway uses.
Subnet Mask	The subnet address that the Gateway uses.
DNS	
DNS Server IP	The IP address of the Domain Name Server (DNS) that the Gateway accesses.
Device DNS name	The device name of the Domain Name Server (DNS) that the Gateway accesses (read-only).
Ethernet	
Port type	Displays information about the Ethernet connection (read-only).
Port settings	The Ethernet speed and duplex that the Gateway uses.

Table 3-2 Addressing Tab Elements (continued)

Field	Description
MAC address	Displays the Mandatory Access Control (MAC) code assigned to the Gateway (read-only).
Port status	Displays the actual Ethernet speed and duplex the Gateway uses on the network (read-only).

Related Topics

- Changing Address Settings on page 40

CHANGING ADDRESS SETTINGS

In the **Addressing** tab, you can change the following address information for the Gateway—IP address information, DNS information and the Ethernet port speed and duplex.

Procedure

1. In the Administrator interface, on the sidebar, click **Device**.
2. Click the **Addressing** tab.
3. To change an IP address setting, do any of the following steps:
   - In the **IP Address** field, type the IP address you want to assign to the Gateway.
   - In the **Router IP** field, type the IP address of the router you want the Gateway to use.
   - In the **Subnet Mask** field, type the subnet mask you want the Gateway to use.
4. In the **DNS Server IP** field, type the IP address of the DNS server that you want the Gateway to use.
5. In the **Port settings** field, choose the Ethernet port and duplex speed value you want to set.
6. On the toolbar, click **Upload**.

Related Topics

- Viewing Address Settings on page 39

Changing the Administrator Interface Web Server Port

Port 80 is the default Administrator interface web server port. For additional security, you can modify the web server port in the **Web** tab.

Procedure

1. In the Gateway interface, on the sidebar, click **Device**.
2. Click the **Web** tab.
3. In the **Web server port** field, enter the port number.
4. On the toolbar, click **Upload**.

Configuring Security

You can configure the access that external programs have to the Gateway. These external programs include Telnet, Simple Network Management Protocol (SNMP), File Transfer Protocol (FTP), and ICMP (Internet Control Message Protocol, or ping).

Procedure

1. In the Gateway interface, on the sidebar, click **Device**.
2. Click the **Security** tab.
3. From the **Security mode** field, choose the access level you want the Gateway to support:
   - **Standard**—Enables SNMP, Telnet, FTP, and ICMP to access the Gateway.
   - **High (no Telnet or Ftp)**—Enables access to the Gateway only through SNMP and ICMP.
   - **Maximum (no Telnet, ftp, SNMP, or ICMP)**—Disallows external programs to access the Gateway.

4 In the **SNMP Read community** and **Write community** fields, enter default strings used to enable SNMP communication between the Gateway and a external application.

5 On the toolbar, click **Upload**.

ABOUT THE GATEWAY ADMINISTRATOR INTERFACE

In the Gateway Administrator interface, you can view Gateway resource information, define the Gateway mode of operation, configure and edit Gateway services, configure physical line settings, monitor and disconnect calls, view reported alert events, and view debugging details. Table 3-3 explains the tabs that appear in the Gateway Administrator interface.

Note There may be slight variations between the configuration options described in this section and the options appearing in the Gateway you are working with.

Table 3-3 *Gateway Administrator Interface Tabs*

Tab Name	Description
Status	Displays Gateway resource usage information, number of calls currently in progress, and servicing gatekeeper details.
Settings	Defines the mode of Gateway operation.
Services	Defines services that the Gateway provides.
Port	Defines physical line settings for that particular PRI or BRI port.
Calls	Displays details on current calls and disconnect calls.
Event Log	Displays reported alert events.
Statistics	Displays specific system information such as call traces and debugging details.
Maintenance	Provides access to maintenance mode, in which you can prevent the Gateway from accepting new calls, and perform software upgrades and other maintenance work.

Figure 3-1 and Table 3-4 display and list the elements in the Gateway Administrator interface.

Figure 3-1 *Gateway Administrator Interface*

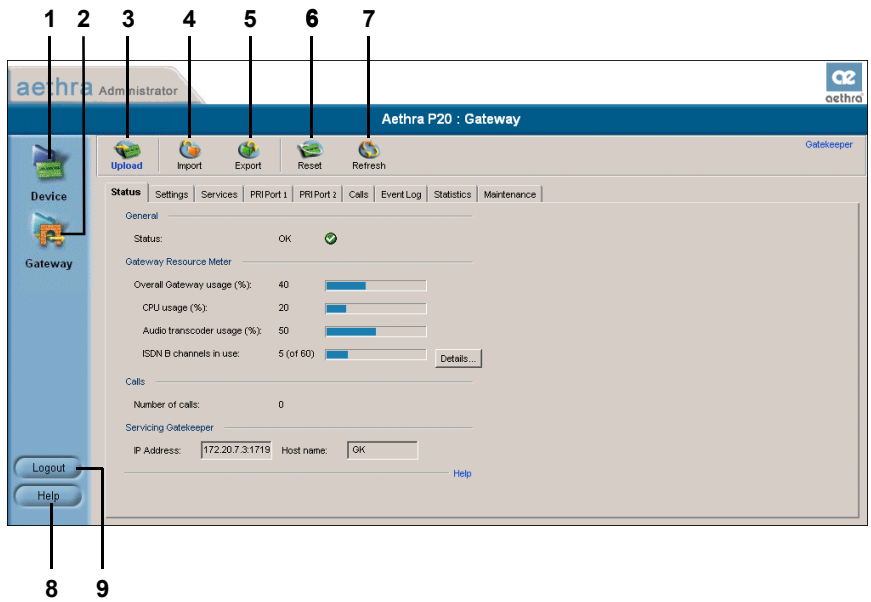


Table 3-4 *Gateway Administrator Interface Elements*

Number	Description
1	Device button
2	Gateway button
3	Upload button
4	Import button
5	Export button
6	Reset button
7	Refresh button
8	Help button
9	Logout button

Note The **Gatekeeper** control on the right side of the toolbar provides a link to the Administrator web page of the Aethra Gatekeeper with which the Gateway registers. Enter the IP address of the Aethra Gatekeeper with which the Gateway registers in the **Specify Gatekeeper address** field in the **IP Connectivity** section of the **Settings** tab when the **IP connectivity mode** option is set to **Using gatekeeper**. For more information, see Configuring the Gateway to Register With a Gatekeeper on page 48

VIEWING THE STATUS TAB

The **Status** tab displays the current rate of use of Gateway resources, the total number of current calls, and servicing details. Table 3-5 lists the information in the **Status** tab.

Table 3-5 *Status Tab Sections*

Section Name	Description
General	■ **Status**—Indicates the operational status of the Gateway: OK or Failure. In cases of failure, a text description of the problem appears. For example, "PRI connection, remote side: loss of frame alignment."
Gateway Resource Meter	■ **Overall Gateway usage (%)**—Displays the rate of Gateway resources currently in use. ■ **CPU usage (%)**—Displays the rate of CPU resources currently in use. ■ **Audio transcoder usage (%)**—Displays the rate of audio transcoding resources currently used for video calls. ■ **ISDN B channels in use**—Displays the total number of Integrated Services Digital Network (ISDN) B channels currently in use.
Calls	■ **Number of calls**—Displays the total number of calls currently in progress in the Gateway.
Servicing Gatekeeper	■ **IP address**—Displays the IP address of the gatekeeper to which the Gateway is currently registered. ■ **Host name**—Displays the name of the servicing gatekeeper.

Related Topics

- Viewing B Channel Status
- Refreshing Gateway Status

Viewing B Channel Status

Note This section applies only to Aethra P20.

From the **Status** tab in the Gateway interface, you can view detailed status information for each B channel.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Status** tab (if not already selected).
3. Click **Details**.

   The **Details** dialog box appears, displaying the following information:

   - **Port 1 and Port 2**—Displays the status of each of the B channels and of the D channel for each of the PRI ports.
   - **Disabled**—Displays the number of disabled B channels for each port.
   - **Used**—Displays the number of B channels currently in use for each port.
   - **Free**—Displays the number of B channels currently available for each port.
   - **D channel**—Displays the number of D channels for each port.

Refreshing Gateway Status

You can refresh the information that appears in the **Status** tab.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Status** tab (if not already selected).
3. On the toolbar, click **Refresh**.

   The information that appears in the **Status** tab is now refreshed.

Configuring Gateway Settings

In the **Settings** tab of the Gateway interface, you can configure gatekeeper and Interactive Voice Response (IVR) addressing, the type of connection to the IP network, dialing delimiters, media encoding/decoding protocols, Quality of Service levels, which events cause the Gateway to send SNMP traps, Gateway resource levels for T.120 enabled and audio transcoded video calls, security settings, and advanced settings such as load balancing support.

The following topics discuss the settings you can configure in the **Settings** tab:

- Configuring Basic Gateway Settings on page 47
- Configuring IP Connectivity Settings on page 48
- Configuring IVR Settings on page 55
- Configuring Outgoing Call Delimiters on page 56
- About Encoding/Decoding Protocols on page 57
- Configuring Encoding/Decoding Protocols on page 59
- Configuring ISDN Channel Bonding Settings for Downspeeding on page 60
- Configuring Quality of Service Settings on page 62
- Configuring Alert Indications on page 64
- Configuring Gateway Resources for Calls on page 70
- Configuring Gateway Encryption on page 72
- Configuring Advanced Settings on page 73
- About DTMF Settings on page 79
- Configuring Advanced Commands on page 83

Configuring Basic Gateway Settings

In the **Basics** section of the **Settings** tab, you can set the Gateway identifier, which is the name that the Gateway uses when registering to a gatekeeper and when dialing to endpoints.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Basics** button (if not already selected).
4. In the **Gateway Identifier** field, type the Gateway identifier.

Configuring IP Connectivity Settings

In the **IP Connectivity** section of the **Settings** tab, you can select the IP connectivity mode in which the Gateway operates, set the address of the gatekeeper with which the Gateway registers, and define the way in which the Gateway interacts with the gatekeeper.

You can configure the IP connectivity mode in the following two ways:

- **Using a gatekeeper**—The Gateway registers with a gatekeeper and uses the gatekeeper for every call (see Configuring the Gateway to Register With a Gatekeeper on page 48).
- **Peer-to-Peer**—The Gateway connects directly to a peer device without the need for a gatekeeper (see Configuring the Gateway for Peer-to-Peer IP Connectivity on page 50).

Caution Changing the IP connectivity mode setting causes the Gateway to reset.

Configuring the Gateway to Register With a Gatekeeper

In the **IP Connectivity** section of the **Settings** tab, you can configure the Gateway to register with a gatekeeper.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **IP Connectivity** button.
4. In the **IP connectivity mode** field, choose **Using gatekeeper**.
5. Make one of the following selections:
   - Select the **Gatekeeper auto discover and register** option button for the Gateway to automatically search for and attempt to register to a gatekeeper.
   - Select the **Specify Gatekeeper address** option button to specify the gatekeeper to which the Gateway registers.
6. In the **Gatekeeper address** field, do one of the following:
   - Type the IP address of the gatekeeper to which the Gateway registers.

   —or—

- Click **Browse**.

  The **Discovered Gatekeepers** dialog box appears, displaying all gatekeepers located on the same network segment as the Gateway.
- Select a discovered gatekeeper.
- Click **OK**.

7 In the **Gatekeeper port** field, type the port number of the gatekeeper. The default setting is 1719.

8 Select the **Registration refresh every n seconds** check box to set the Time To Live interval (in seconds) that determines how often the Gateway sends a "keep alive" message to the gatekeeper to ensure that the Gateway registration is listed with the gatekeeper and does not expire. Enter a value in seconds in the field.

9 In the **Gateway registration mode** field, choose the method of registration of services with the gatekeeper:

- **Version 1**—For gatekeepers that support H.323 version 1.
- **Version 2**—For gatekeepers that support H.323 version 2 or later.

10 (PRI gateways only) Select the **Unregister from Gatekeeper on ISDN connection failure** check box to force the Gateway to unregister from its gatekeeper when both ISDN D-channel connections are no longer active. The gatekeeper is forced to send new IP-to-ISDN calls through a different Gateway, thus ensuring high call completion rates. The Gateway re-registers to the gatekeeper when the ISDN connected is restored.

11 Select the **Send load balancing messages (RAI)** check box to enable the sending of RAI messages to the gatekeeper for the purpose of load balancing on the network. If you select this option, perform step 12 and step 13.

Gatekeepers can perform load balancing on the network using feedback from the Gateway in the form of Resource Available Indication (RAI) messages that inform the gatekeeper of

Gateway resource availability. If the Gateway is unavailable, the gatekeeper performs line hunting operations to route the call to an alternative gateway.

When you set the Gateway for RAI/RAC, it sends periodic RAI messages that inform the gatekeeper of the current resource availability in the Gateway. The gatekeeper responds with Resource Available Confirmation (RAC) messages to acknowledge receipt of the RAI messages. In step 12 and step 13, you can configure the upper and lower threshold for triggering RAI messages according to resource availability in the Gateway.

12 In the **Send 'busy' when load is more than** field, enter the upper threshold for Gateway resource utilization as a percentage of total resources. When resource use is greater than the threshold, the Gateway sends the gatekeeper a 'busy' RAI message, indicating to the gatekeeper that it should stop routing calls to this Gateway.

13 In the **Send 'free' when load is more than** field, enter the lower threshold for Gateway resource utilization as a percentage of total resources. When resource use is less than the threshold, the Gateway sends the gatekeeper a 'free' RAI message, indicating to the gatekeeper that it can resume routing calls to this Gateway.

Configuring the Gateway for Peer-to-Peer IP Connectivity

In the **IP Connectivity** section of the **Settings** tab, you can configure the Gateway for peer-to-peer IP connectivity.

Procedure

1 In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).

2 Click the **Settings** tab.

3 Click the **IP Connectivity** button.

4 In the **IP connectivity mode** field, choose **Peer-to-Peer**.

Note Changing this setting causes the Gateway to reset.

5 In the **Peer hunting mode** field, choose one of the following options:

- **Always start from first peer**—The Gateway attempts to connect a call to the first peer device on the **Peer list** section. If the call fails due to one of the H.323 call disconnect reasons (see About Peer-to-Peer H.323 Call Disconnect Reasons on page 54), the Gateway tries each peer device in the **Peer list** section in order until the call is successfully connected. If the Gateway fails to connect the call after trying all the peer devices on the list, it rejects the call.
- **Always start from last successful peer**—The Gateway attempts to connect a call to the last peer device in the **Peer list** section with which a call was successfully established. An arrow in the **Peer list** section indicates with which of the peer devices a call was last connected successfully. If the call fails due to one of the H.323 call disconnect reasons (see About Peer-to-Peer H.323 Call Disconnect Reasons on page 54), the Gateway tries each peer device in the **Peer list** section in order until the call is successfully connected. The arrow moves to the peer device with which the call connection is successful. If the Gateway fails to connect the call after trying all the peer devices on the list, it rejects the call and the arrow indicates with which peer device a call was last connected successfully. This is the default setting.

- **Round Robin**—As for the **Always start from last successful peer** setting, except that the arrow advances to the next peer device in the **Peer list** section even if the call connection succeeds.

Note The peer hunting process starts when any of the following events occur: the Gateway fails to establish a Transmission Control Protocol (TCP) connection to the specified peer device after a timeout; the Gateway receives a "Release Complete" message from a peer device with a "No Resources" call rejection reason, or one of the other reasons that the Peer-to-Peer disconnect reason add advanced command specifies; or the Gateway establishes a TCP connection to the specified peer device, but does not receive a valid H.323 message from the peer device after a timeout.

---

6 In the **Peer list** section, you can configure peer devices currently configured to work with the Gateway. The **Peer list** section displays all configured peer devices in a table with the following columns:

- **Peer #**—The sequential number of the peer in the list.
- **Description**—The description of the peer device.
- **IP Address**—The peer IP address.
- **IP Port**—The peer IP port number.
- **Calls**—Displays "Yes" or "No" to indicate whether or not there are currently any active calls between the peer and Gateway.

To change the order of peer devices used in peer hunting, select a peer device and click the up or down arrow button to change its order.

To add or edit a peer device, click **Add** or select the peer device and click **Edit**. Perform the following steps in the **Add peer** or **Edit peer** dialog box:

- In the **IP Address** field, type or edit the peer IP address.

Note Two peers cannot have the same IP address or host name/Uniform Resource Locator (URL).

- In the **IP Port** field, enter or edit the peer IP port number.
- In the **Description** field, enter or edit the description of the peer.
- Click **Upload**.

Note You cannot add a single peer to the **Peer list** section more than once.

To delete a peer device, select the peer device and click **Delete**. Deleting a peer does not cause its active calls to disconnect, but no new calls are routed to the deleted peer.

Note The peer hunting process stops when one of the peer devices accepts the call or when the call is rejected with a disconnect reason. When a Gateway has scanned the **Peer list** section and still cannot connect a call, the following rules apply: if at least one of the peers rejected the call due to capacity overload, the call rejection reason (towards the call originator) is "No Resources"; in all other cases, the call rejection reason is "Unreachable Destination."

7. In the **Peer hunting timeout (sec)** field, enter the length of time (between 1 and 10 seconds) for which the Gateway waits for a Transmission Control Protocol (TCP) response from each peer device contacted. The default value is 5 seconds.
8. Select the **Accept calls from defined peers only** check box if you want the Gateway to reject incoming calls from IP-side entities not defined in the peer list. If deselected, the Gateway allows incoming calls from IP-side entities not defined in the **Peer list** section.
9. In the **Reject calls from peer devices when less than *n* B channels are free** field, type the lower capacity threshold for rejecting calls from H.323 peer devices. The default setting is 6.

About Peer-to-Peer H.323 Call Disconnect Reasons

Table 3-6 lists the reasons for which the Gateway peer-to-peer hunting module might disconnect a call.

Table 3-6 *Peer-to-Peer H.323 Call Disconnect Reasons*

Number	H.323 Call Disconnect Reason
1	There is no available bandwidth.
2	Gatekeeper resources have been exhausted.
3	The destination cannot be reached.
4	The destination rejected the transaction request.
5	Version is not compatible.
6	No permission to perform requested transaction.
7	The destination gatekeeper cannot be reached.
8	Gateway resources have been exhausted.
9	Destination address is not formatted correctly.
10	LAN crowding has caused the call to be dropped.
11	The destination is busy and cannot respond to the call transaction.
12	Undefined reason for transaction failure.
13	Call should be routed to a gatekeeper.
14	Call should be forwarded.
15	Call should be routed to an MC.
16	Call deflection has occurred.
17	Access denied.
18	The called party is not registered at the destination.
19	The calling party is not registered.

Table 3-6 Peer-to-Peer H.323 Call Disconnect Reasons (continued)

Number	H.323 Call Disconnect Reason
20	The connection failed and a new one should be made.
21	The called party has no H.245 capabilities.
22	Facility message sends conference list choice.
23	Request to establish H.245 connection.
24	An indication from an endpoint or a gatekeeper to send a new set of tokens in the *tokens* and/or *cryptoTokens* field of the **Facility** message.
25	Indicates that the purpose of the message is to update feature set information that was previously sent in the Facility message.
26	Indicates that the purpose of the message is to forward elements of another message, if that message cannot be sent.
27	Indicates that the purpose of the message is to transport higher-layer information.

CONFIGURING IVR SETTINGS

In the **IVR** section of the **Settings** tab, you can configure the Gateway to route calls using an Interactive Voice Response (IVR) system.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **IVR button**.
4. Select the type of IVR functionality:
   - **Use internal IVR**—Enables the Gateway IVR functionality so that incoming calls can route to an endpoint on the IP network. Follow step 5 to step 8.

Note The IVR must be enabled for the port that supports IVR.

- **Use external IVR**—Select to set the IP address and port number for an IVR system in another device. Follow step 9 and step 10.

5. In the **IVR registration name** field, type the IVR registration alias used with the gatekeeper.
6. Deselect the **Transfer to Operator when '*' pressed during IVR** check box to ignore the IVR operator digit (which is currently "*") and make it part of the dial string.
7. In the **IVR Operator Extension** field, set the E.164 number of an endpoint that is registered with the gatekeeper to function as an IVR operator for incoming calls. To do this, type the same number for the IVR operator extension for each of the IP terminals that you want to include in the single number access. You can also use an ISDN endpoint as the IVR operator extension. To do this, define the IVR operator extension using the format <Gateway service><ISDN number>.
8. Select the **IVR registers with gatekeeper** check box to enable the internal IVR to register with the gatekeeper.
9. In the **IVR address** field, type the IP address for the IVR system on the external device.
10. In the **Port** field, type the port number for the IVR system on the external device. The default port setting is 1620.

Configuring Outgoing Call Delimiters

In the **Delimiters** section of the **Settings** tab, you can configure outgoing call delimiter characters.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Delimiters** button.
4. In the **Second number delimiter** field, type the character used as a second number delimiter for dialing more than one ISDN number in setting up a 2B call. You can use the pound sign (#), asterisk (*) or comma (,) as a delimiter in outgoing calls only.

5 In the **TCS4 extension delimiter** field, type the character used as an extension number for TCS4 outgoing IP-to-ISDN call routing. You can use the pound sign (#), asterisk (*) or comma (,) as a delimiter in outgoing calls only. This setting does not apply for voice calls.

Note Since the comma cannot be used in the **Party number** field of the MCU Conference Control interface, we recommend that you do not use the comma as a second number delimiter or as a TCS4 extension delimiter.

About Encoding/Decoding Protocols

A number of video conferencing terminal applications require the G.722 and G.722.1 audio compression codecs to provide high quality voice communications. The G.722 and G.722.1 formats, using a digital sampling rate of 7 KHz, provide higher quality voice sampling with a greater dynamic range. The Gateway does not transcode G.722 or G.722.1, but supports them transparently. Since the G.722 codec is of a much higher audio quality than other codecs and requires higher bandwidths, the Gateway supports G.722 and G.722.1 at the following call bit rates:

- G.722 is supported in calls at 224, 256, 336, 384, 448, 512 Kbps (all Gateways) and 768, 1472 and 1920 Kbps (PRI gateways only).
- G.722.1 is supported in calls at 64, 2B, and 128 Kbps.

Both endpoints in a call must support G.722 and G.722.1 audio codecs.

About Audio Transcoding

The Aethra P20 supports audio transcoding through the Audio Transcoder Module (TCM). Other Aethra Gateways support audio transcoding through on-board Digital Signal Processing (DSP).

The TCM is a PCI mezzanine card (PMC) that implements Digital Signal Processing (DSP). The TCM has a processing capacity of up to 20 channels for audio transcoding in video calls.

The Gateway TCM can perform audio transcoding between the following types of audio protocols:

- G.711 (ISDN) to G.723.1 (IP)
- G.723.1 (IP) to G.711 (ISDN)

- G.728 (ISDN) to G.711 (IP)
- G.711 (IP) to G.728 (ISDN)

Note When your unit includes both a Gateway and MCU, G.728 transcoding is supported on the MCU only.

Each audio codec differs in the audio quality, compression, and bit rates that it provides. The G.711 codec provides toll quality audio at 64 Kbps, the G.728 codec provides near toll quality audio at 16 Kbps, and the G.723.1 codec provides voice quality audio at 5.3 or 6.4 Kbps.

Endpoints on the ISDN network usually support the G.711 and G.728 codecs. Endpoints on IP networks support G.711 and G.723.1 codecs. By performing transcoding between these audio protocols, the Gateway can support communication between endpoints with codecs that are incompatible with each other.

Audio transcoding can also optimize the audio bandwidth usage either on the IP network (G.723.1 < > G.711) or on the ISDN network (G.728 < > G.711). Transcoding is particularly useful for ISDN codecs, where bandwidth can be limited to 128 Kbps for a video call. For example, when transcoding between G.728 and G.711 takes place, the audio bandwidth usage is compressed to 16 Kbps. This provides an additional 40 Kbps of bandwidth to the existing video bit rate on the ISDN network, contributing to improved video quality.

Note The Gateway automatically performs A-Law G.711-to-µ-Law G.711 translation between the IP and ISDN sides if needed.

You can configure the Gateway to prioritize the transcoding, giving preference to a particular codec that is applied to calls, thus optimizing the resource allocation utilized by each call.

About T.120 Data Collaboration Support

The Gateway provides full end-to-end support for T.120 data collaboration sessions, provided all terminals support the T.120 standard in their conferencing applications. In video calls with data transfer, the Gateway accepts whatever bandwidth the ISDN connection defines for the data and dynamically adjusts the outgoing bandwidth used for data by using the MLP, HMLP and VarMLP formats.

If transcoding or T.120 capabilities are required, the Gateway has to reserve resources for these. The Gateway can differentiate between those calls that support T.120 and those that do not. When receiving calls, the Gateway can check whether you are reserving resources for transcoding or for T.120 capabilities.

The Gateway enables the user to determine the trade-off between the number of non-T.120 calls that the Gateway can support and the number of calls sent with T.120 capabilities. The total number of calls that the Gateway can support is accordingly reduced by this reallocation of resources.

The H.320 standard defines space allocation within a call. The H.320 standard defines the logic for bit rate allocation among audio, video and data channels in the context of the overall bit rate of a call. If you work with T.120, reallocation of bandwidth is always at the expense of available video resources. The requirements of the H.320 standard govern this reallocation—it is not configured in the Gateway. The Gateway simply decides whether or not to send T.120 capabilities. You configure T.120 capabilities in the **Advanced** section of the Gateway interface **Settings** tab.

Configuring Encoding/Decoding Protocols

In the **Media Modes** section of the **Settings** tab, you can configure and prioritize encoding and decoding protocols.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Media Modes** button.
4. In the **Transcoding priority** field, choose the priority that determines the order of requested audio transcoding or choose **Disable** to disable audio transcoding priority.

Note When your unit includes both a Gateway and an MCU, G.728 transcoding is supported on the MCU only.

---

5. You can configure the following audio codec settings:
   - Select the **Enable G.722** check box to enable transparent support for the G.722 audio codec.

- Select the **Enable G.722.1** check box to enable transparent support for the G.722.1 audio codec.
- Select the **Enable G.728** check box to enable transparent support for the G.728 audio codec.

6 You can configure the following video codec settings:

- Select the **Enable H.263** check box to enable transparent support for the H.263 video codec.
- Select the **Enable H.263+** check box to enable transparent support for the H.263+ video codec.
- Select the **Enable H.264** check box to enable transparent support for the H.264 video codec.

7 You can configure the following data settings:

- Select the **Enable T.120** check box to enable transparent support for T.120 capabilities.
- Select the **Enable FECC** check box to enable transparent support for Far End Camera Control (FECC) capabilities.

Configuring ISDN Channel Bonding Settings for Downspeeding

In the **Bonding** section of the **Settings** tab, you can configure ISDN channel bonding parameters that affect downspeeding functionality.

Downspeeding is the ability to complete and maintain a call when ISDN conditions are bad. In downspeeding, call capabilities are automatically renegotiated when a call fails. Downspeeding contributes to a higher percentage of call completion on the network. The Gateway supports downspeeding at call setup and in mid-call.

With downspeeding, when connection problems occur at call setup, the Gateway attempts to connect a call at a lower bit rate than that requested. Administrators can configure the Gateway to attempt to connect a video call at a specified minimum bit rate, or to attempt to connect the call as a voice call.

In downspeeding, when connection problems occur in mid-call, the Gateway attempts to connect a video call at the specified lower bit rate. When downspeeding is complete and the call is connected at the specified lower bit rate, the Gateway notifies the Internet Protocol (IP) endpoint of the new call rate.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Bonding** button.
4. Select the **Enable bonding** check box to enable ISDN bonding support.
5. In the **Maximum B channels for bonded call** field, choose the maximum number of B channels—3, 4, 5, 6, 8, 12, 23 or 30—that you want to allow for a single bonded call. The default setting for PRI gateways is 30. The default setting for BRI Gateways is 8.

   When the number of B channels required to process a bonded call exceeds the number specified in this field, the Gateway performs downspeeding as shown in Table 3-7.
6. In the **For bonded calls, allow downspeeding down to *n* B channels field**, choose the minimum number of B channels that must be available before the Gateway attempts to reconnect a video call.

Table 3-7 *Downspeeding Policy Operation*

Call Direction	Downspeed Advanced Command Parameter	If Call B Channels Exceed the Maximum:
IP (LAN) to WAN (ISDN)	enable (default)	Gateway tries to call at the maximum number of B channels
IP (LAN) to WAN (ISDN)	disable	Call disconnects
WAN (ISDN) to LAN (IP)	enable (default)	Call disconnects
WAN (ISDN) to LAN (IP)	disabled	Call disconnects.

CONFIGURING QUALITY OF SERVICE SETTINGS

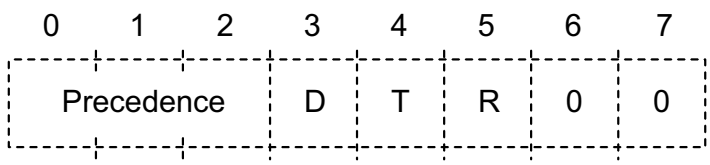
You can configure the Gateway to add a Quality of Service (QoS) IP precedence code in the IP header of outbound packets on the IP network. Routers on the network that support this method can give precedence to such coded packets and facilitate the transmission of the packets more efficiently. You can set priority levels on the Gateway for voice calls, video calls, or both.

The Type of Service (TOS) field in the IP header contains eight bits and indicates the three abstract quality of service parameters:

- Delay (D)
- Throughput (T)
- Reliability (R)

You can use the abstract parameters to choose the actual service parameters when transmitting a datagram through a particular network. The abstract parameters represent the three-way trade off between low delay, high throughput, and high reliability. Increasing the performance of one of the parameters can result in reduced performance of the other two. The TOS field in the IP header is shown in Figure 3-2.

Figure 3-2 *TOS Field in the IP Header*



Note The same fields can also be used to set DiffServ codepoint values

The function of each bit of the ToS field is as follows

- Bits 0-2: Precedence (an independent measure of the importance of the datagram)
- Bit 3: 0 = normal delay, 1 = low delay
- Bit 4: 0 = normal throughput, 1 = high throughput
- Bit 5: 0 = normal reliability, 1 = high reliability
- Bits 6-7: reserved for future use

The possible Precedence settings are as follows:

- 111 = Network Control

- 110 = Internetwork Control
- 101 = CRITIC/ECP
- 100 = Flash Override
- 011 = Flash
- 010 = Immediate
- 001 = Priority
- 000 = Routine

In the **Quality of Service** section of the **Settings** tab, you can assign a priority level to video and voice calls.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Quality of Service** button.
4. In the **Quality of service support** field, select one of the following option buttons:
   - **None**—Select to disable quality of service support.
   - **Default (recommended)**—Select to assign the default IP Type of Service (ToS) value for each media type.
   - **Custom**—Select to assign your own IP ToS value for each media type. You can configure the following additional settings:
     - In the **Control Priority (0-63)** field, enter a whole number from 0 to 63 to set the priority level of signaling packets that the Gateway sends out. The default value is 26.
     - In the **Video Calls** section **Voice Priority (0-63)** field, enter a whole number from 0 to 63 to set the priority level of voice packets that the Gateway sends out. The default value is 46.
     - In the **Video Priority (0-63)** field, enter a whole number from 0 to 63 to set the priority level of video packets that the Gateway sends out. The default value is 34.

- In the **Data Priority (0-63)** field, enter a whole number from 0 to 63 to set the priority level of data packets that the Gateway sends out. The default value is 26.
- In the **Voice Calls** section **Voice Priority (0-63)** field, enter a whole number from 0 to 63 to set the priority level of voice packets that the Gateway sends out. The default value is 46.

Note You can click **Restore Defaults** to restore all default settings.

CONFIGURING ALERT INDICATIONS

In the **Alert Indications** section of the **Settings** tab, you can select which events trigger Simple Network Management Protocol (SNMP) traps. You can also define multiple SNMP servers to which the Gateway sends the SNMP traps.

Note The Gateway supports traps in the SNMPv1 format.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Alert Indications** button.
4. In the **Events** section, select events in the **Disabled events** field and click **Add** to select an event to monitor. Or, select an event in the **Enabled events** field and click **Remove** to remove that event from monitoring.
5. Select the **Send SNMP Traps** check box to configure the IP address of the SNMP server to which the Gateway sends SNMP trap notifications of the events selected in the **Enabled events** field. You can configure up to three different SNMP trap servers.
6. In the **Trap server IP** and **Port** fields, enter the IP address and port number for each SNMP server to which you want the Gateway to send SNMP trap notifications. To remove an

SNMP server, set the SNMP server IP address to 0.0.0.0 and press the **Upload** button.

Related Topics

- Gateway Event Types on page 65
- Trap Severity Enumeration on page 70

GATEWAY EVENT TYPES

Table 3-8 lists proprietary Aethra SNMP trap event types for the Aethra P20 Gateway, as detailed in the **RvTrapEventType** textual convention.

Table 3-9 lists SNMP trap event types for the Aethra B40 Gateway, as detailed in the **RvTrapEventType** textual convention.

Note In certain cases, after a problem that caused a trap to be sent has been solved, an identical clearing trap is sent to indicate that the problem has been solved. The severity of the clearing trap is always 0. The trap OID and the **RvTrapEventType** value of the clearing trap are identical to those of the original trap sent when the problem occurred. The sending of a clearing trap is indicated by a severity level of "Clear".

Table 3-8 *Aethra P20 Gateway SNMP Trap Event Types*

Event Type	Trap is sent when ...	State	Severity
RAI status	A change in RAI status occurs.	TRUE	Warning
		FALSE	Clear
Bad video	Corrupt or empty video packets are present in the Gateway. Includes the ID number of the call during which the event occurs.	TRUE	Minor
		FALSE	Clear
Power-up	The Gateway has started to operate.		Information
Power-down	The Gateway is shutting down.		Information
Gatekeeper registration state change	A change occurs in the registration status of the Gateway.	TRUE	Clear
		FALSE	Minor

Table 3-8 *Aethra P20 Gateway SNMP Trap Event Types (continued)*

Event Type	Trap is sent when ...	State	Severity
Loss of ISDN	A state change occurs for each enabled ISDN line.	TRUE	Critical
		FALSE	Clear
Loss of Ethernet	The network returns after going down. Indicates the time at which the network was restored.	TRUE	Critical
		FALSE	Clear
Max resource meter	A call could not be established because of a lack of one of the following resources—CPU, audio transcoder, DTMF detector or T.120 resources.		Warning
Network problem	A problem occurs on the network.	TRUE	Major
		FALSE	Clear
Card extract/Hot Swap	A card has been removed from the Aethra chassis under power or inserted into the chassis under power, or the when the Gateway enters maintenance mode.	TRUE	Critical
		FALSE	Clear
Abnormal disconnect	A call has disconnected for a reason other than normal, busy or no answer.		Warning
ISDN downspeed	ISDN downspeeding to a lower rate is taking place.		Warning
Corrupt IVR messages on host	Corrupt IVR files are present in the Gateway.		Warning
Corrupt WEB data	Corrupt web files are present in the Gateway.		Major

Table 3-8 *Aethra P20 Gateway SNMP Trap Event Types (continued)*

Event Type	Trap is sent when ...	State	Severity
ISDN rollover activated	The Gateway notifies the PSTN switch that the Gateway cannot accept any further calls. ISDN rollover requires support by the PSTN switch application and presumes the availability of a pool of stacked Gateways across the managed network. You can enable ISDN Rollover only after you set the Gateway to work with the T1 interface.		Major
Call to peer rejected - trying alternate	A call to a peer has been rejected and the Gateway is searching for an alternate peer.		Warning
Call from peer rejected due to capacity	A call from a peer has been rejected because the Gateway does not have enough resources available.		Warning
Call to peer rejected by all listed peers	A call to a peer has been rejected by all listed peers.		Major
Call to peer failed - peer list empty	A call to a peer has failed because the peer list is empty.		Major
Incompatible sw version install	An attempt to burn a version of the Gateway software onto incompatible hardware occurs.		Warning
Call from non-peer H.323 entity rejected	The Gateway has rejected an incoming IP call because the source does not appear in the peer list.		Warning

Table 3-9 *Aethra B40 Gateway SNMP Trap Event Types*

Event Type	Trap is sent when ...	State	Severity
RAI status	A change in RAI status occurs.	TRUE	Warning
		FALSE	Clear
Bad video	Corrupt or empty video packets are present in the Gateway. Includes the ID number of the call during which the event occurs.	TRUE	Minor
		FALSE	Clear
Power-up	The Gateway has started to operate.		Information
Power-down	The Gateway is shutting down.		Information
Gatekeeper registration state change	A change occurs in the registration status of the Gateway.	TRUE	Clear
		FALSE	Minor
Loss of ISDN	A state change occurs for each enabled ISDN line.	TRUE	Critical
		FALSE	Clear
Loss of Ethernet	The network returns after going down. Indicates the time at which the network was restored.	TRUE	Critical
		FALSE	Clear
Max resource meter	A call could not be established because of a lack of one of the following resources—CPU, audio transcoder, DTMF detector or T.120 resources.		Warning
Network problem	A problem occurs on the network.	TRUE	Major
		FALSE	Clear
Card extract/Hot Swap	A card has been removed from the Aethra chassis under power or inserted into the chassis under power, or the when the Gateway enters maintenance mode.	TRUE	Critical
		FALSE	Clear
Abnormal disconnect	A call has disconnected for a reason other than normal, busy or no answer.		Warning

Table 3-9 *Aethra B40 Gateway SNMP Trap Event Types (continued)*

Event Type	Trap is sent when ...	State	Severity
ISDN downspeed	ISDN downspeeding to a lower rate is taking place.		Warning
Corrupt IVR messages on host	Corrupt IVR files are present in the Gateway.		Warning
Corrupt WEB data	Corrupt web files are present in the Gateway.		Major
ISDN rollover activated	The Gateway notifies the PSTN switch that the Gateway cannot accept any further calls. ISDN rollover requires support by the PSTN switch application and presumes the availability of a pool of stacked Gateways across the managed network. You can enable ISDN Rollover only after you set the Gateway to work with the T1 interface.		Major
Call to peer rejected - trying alternate	A call to a peer has been rejected and the Gateway is searching for an alternate peer.		Warning
Call from peer rejected due to capacity	A call from a peer has been rejected because the Gateway does not have enough resources available.		Warning
Call to peer rejected by all listed peers	A call to a peer has been rejected by all listed peers.		Major
Call to peer failed - peer list empty	A call to a peer has failed because the peer list is empty.		Major
Incompatible sw version install	An attempt to burn a version of the Gateway software onto incompatible hardware occurs.		Warning
Call from non-peer H.323 entity rejected	The Gateway has rejected an incoming IP call because the source does not appear in the peer list.		Warning

Trap Severity Enumeration

Table 3-10 describes the proprietary Aethra Gateway SNMP trap severity enumerations.

Table 3-10 *Proprietary Aethra Gateway SNMP Trap Severity Enumerations*

Trap Severity	Enumeration	Description
Cleared	0	One or more previously reported alarms have been cleared.
Information	1	Notification of a non-erroneous event.
Critical	2	A service-affecting event has occurred and immediate corrective action is required.
Major	3	A service-affecting event has occurred and urgent corrective action is required.
Minor	4	A non-service-affecting event has occurred and corrective action is required to prevent the condition becoming more serious.
Warning	5	A potential or impending service-affecting event has been detected, but no significant affects have been felt yet. Action should be taken to further diagnose and correct the problem to prevent the condition becoming more serious.

Configuring Gateway Resources for Calls

Note The **Resources** section is available in Aethra P20 only.

In the **Resources** section of the **Settings** tab, you can reserve Gateway resources for T.120 enabled calls and for audio transcoded video calls. This section also displays the total number of calls that the Gateway supports at specified bandwidths.

The Gateway provides full end-to-end T.120 data collaboration sessions, provided that all terminals support the T.120 standard in their conferencing applications. In video calls with data transfer, the Gateway accepts whatever

bandwidth the ISDN connection defines for the data and dynamically adjusts the outgoing bandwidth used for data by using the MLP, HMLP and VarMLP formats.

You can also configure the Gateway to prioritize the transcoding, giving preference to a particular codec that is applied to calls, thus optimizing the resource allocation utilized by each call.

The Gateway supports up to 30 video calls on two B channels. If transcoding or T.120 capabilities are required, the Gateway has to reserve resources for these. The Gateway can differentiate between those calls that support T.120 and those that do not. When receiving calls, the Gateway can check whether you are reserving resources for transcoding or for T.120 capabilities.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Resources** button.
4. In the **Maximum number of T.120 calls** field, enter the number of T.120 enabled calls that you want to reserve Gateway resources for. The maximum number is 18.
5. In the **Maximum number of video calls with audio transcoding** field, enter the number of audio transcoded video calls you want to reserve Gateway resources for. The maximum number is 20.

Note The term *audio transcoded video calls* refers to the process whereby an audio stream in a multimedia call is transcoded from one codec type to another.

6. In the **Total call capacity: *n* calls of *n* Kbps** field, choose a bandwidth.
7. Click **Update total call capacity**.

   The number of calls that the Gateway can support at that bandwidth automatically appears.

CONFIGURING GATEWAY ENCRYPTION

The Gateway supports encrypted calls over IP networks. The encryption conforms to the H.325 standard and supports the following encryption algorithms:

- DES—With an encryption key of 56 bits
- AES—With an encryption key of 128 bits

Gateway encryption operates in one of the following modes or can be disabled entirely:

- **Best effort**—Implements a "best effort" encryption algorithm. If an endpoint supports encryption, it connects in an encrypted way. If not, it connects without encryption.
- **Encryption required**—Only connects encrypted calls. Encryption can either be AES 128 or DES 56. The Gateway does not allow non-encrypted calls to connect.
- **Strong encryption required**—Only allows AES 128 encrypted calls. The Gateway does not allow endpoints that do not support AES 128 to connect.

Table 3-11 summarizes the encryption-related capabilities that the Gateway offers.

Table 3-11 *Gateway Supported Encryption Capabilities*

Mode	Capabilities
Encryption off	Priority 1: No encryption
Best effort	Priority 1: AES 128 Priority 2: DES 56 Priority 3: No encryption
Encryption required	Priority 1: AES 128 Priority 2: DES 56
Strong encryption required	Priority 1: AES 128

The following channels support encryption:

- Audio channel
- Video Channel
- Far End Camera Control (FECC)

Note All channels (audio, video and FECC, incoming, outgoing) on the same call must have the same encryption levels. If the same encryption on all channels is not achieved, the call disconnects.

In the **Security** section of the **Settings** tab, you can configure Gateway encryption settings.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Security** button.
4. Select the **Support encryption** check box to enable Gateway support for H.235 encryption for H.323 calls.
5. In the **Encryption mode** field, choose one of the following settings:
   - Best effort
   - Encryption required
   - Strong encryption required

CONFIGURING ADVANCED SETTINGS

In the **Advanced** section of the **Settings** tab, you can configure, enable, and disable various advanced Gateway settings.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.

3 Click the **Advanced** button.

Table 3-12 explains the IP-to-ISDN call settings you can configure in this section.

Table 3-13 explains the ISDN-to-IP call settings you can configure in this section.

Table 3-14 explains the IP call settings you can configure in this section.

Table 3-15 explains the ISDN call settings you can configure in this section (available in Aethra P20 only).

Table 3-16 explains the general call settings you can configure in this section.

Table 3-12 *Advanced Settings—IP to ISDN Calls*

Field or Check Box	Description
Conceal caller ID	Select to have the Gateway hide the identifier of the calling endpoint on the IP network, regardless of whether the **Support Presentation Restriction** advanced setting is selected. The *callerID* field of the Q.931 message is sent over the ISDN network empty.
Ignore caller bearer rate and force service rate	Select to configure the Gateway to ignore the incoming call bearer rate and to use instead the bandwidth specified for the service in the **Services** tab to process the call. If the service bit rate is set to **Auto**, the Gateway process the call at the bearer rate. Deselect to allow an administrator to limit a specific service to a maximum bit rate. When deselected and the bearer rate is greater than the service rate, the Gateway processes the call at the service rate. When deselected and the bearer rate is lower than or equal to the service rate, the Gateway processes the call at the bearer rate. If the bearer bit rate is set to **Auto**, the Gateway process the call at the bearer rate.

Table 3-12 Advanced Settings—IP to ISDN Calls (continued)

Field or Check Box	Description
Auto dial voice call in case of video call fail	Select to instruct the Gateway to attempt to reconnect video calls as voice calls after a video call has failed at call setup. The Gateway uses the auto-redial mechanism for outgoing video calls when any of the ISDN disconnect reasons listed below occur. When selected, the Gateway first tries to redial the call as a restricted video call at 56 Kbps. If the call fails for any of the reasons listed below, the Gateway tries to redial the call as a voice call. When deselected, the call disconnects. The Gateway log indicates both the disconnect reason and the Gateway attempt at redialing. **Note** The auto-redial mechanism operates independently of the downspeeding functionality. The ISDN disconnect reasons are: ■ 0x12—No user responding. ■ 0x39—Bearer capacity not authorized. ■ 0x3a—Bearer capacity not presently available. ■ 0x3f—Reports a “service or option not available” event only when no other cause in the “service or option not available” class applies. ■ 0x4f—Reports a “service or option not implemented” event only when no other cause in the “service or option not implemented” class applies. ■ 0x41—Bearer capability not implemented. ■ 0x45—Requested facility not implemented. ■ 0x58—Incompatible destination.
Use default service bit rate of *n* kbps for services defined to use ‘auto’ bit rate	Choose the default bit rate. When using a service with the bit rate set to Auto, the Gateway uses the default bit rate if the received bearer rate is not one of the supported bit rates.

Table 3-13 Advanced Settings—ISDN to IP Calls

Field or Check Box	Description
Conceal caller ID	Select to have the Gateway hide the identifier of the calling endpoint on the ISDN network, regardless of whether or not the **Support Presentation Restriction** advanced setting is selected. The *callerID* field of the Q.931 message is sent over the IP network containing the string "0000."
Enable T.120 capabilities in incoming IVR and TCS4 calls	Select to enable the Gateway to send T.120 capabilities messages to the ISDN endpoint upon receiving a call at the IVR-internal or TCS4 stage. The Gateway sends the T.120 messages before connecting to the IP network endpoint.
Support sub-address at Call Setup	Sub-addressing is a one-stage Direct Inward Dialing (DID) dialing mechanism in which a phone sends two numbers. One number is for routing on the circuit switched network. The other number is forwarded to the Gateway inside a Q.931 sub-addressing information element for IP address resolution by the gatekeeper. Sub-addressing can also be used for implementing ISDN fallback when not enough bandwidth is available for routing an IP-oriented call over IP. Select for the Gateway to take the E.164 number from the Q.931information element sub-address field and forward it to the gatekeeper for address resolution. Sub-addressing requires gatekeeper support.

Table 3-14 Advanced Settings—IP Options

Field or Check Box	Description
Support H.323 Fast Start in voice-only call setup	The H.323 fast start functionality enables endpoints that support the feature to join a voice conference in the Gateway more quickly. Standard call setup requires four round trips of messages between endpoints before the first media stream is exchanged between peers. The set of messages includes Setup/Connect (Q.931 procedure), Master/Slave Determination (H.245 procedure), Capability Exchange (H.245) and Open Logical Channel (H.245). H.323 fast start shortens the time it takes to start a call by skipping the H.245 phase and combining the call setup procedure into a single H.225 transaction. Select to encapsulate H.245 capabilities exchange and negotiation messages within Q.931 setup messages.
Enable packet handling (may increase call delay)	Select to configure the maximum rate of jitter tolerance in the **Network jitter tolerance** field. Jitter occurs when IP packets sent at a steady rate reach their destination at different speeds. Streams can also split on their way to the Gateway between different routers. This can cause a “later” packet B to arrive before an “earlier” packet A, even though A was sent before B.
Network jitter tolerance	If you selected the **Enable packet handling (may increase call delay)** check box, then enter the maximum rate of jitter tolerate in milliseconds. Packet loss occurs when jitter exceeds the configured rate.

Table 3-15 Advanced Settings—ISDN Options

Field or Check Box	Description
Request ISDN rollover when less than *n* B channels are available (available in Aethra P20 only)	Select to define when the Gateway uses the ISDN rollover feature (which is defined in advanced commands—see Configuring Advanced Commands on page 83 for more information). When the total number of available B channels in both PRI ports falls below the number specified in this field, the Gateway sends a "busy out" message to the PSTN switch for each of the remaining B channels. The switch application "busies out" the remaining B channels and diverts new calls to other gateways on the network with greater available resources. This setting is only active after you configure the Gateway to use a 4ESS PRI line. For example, you specify 10 in the **Request ISDN rollover when less than *n* B channels are available** field and the number of available B channels falls to 9. The Gateway sends a "busy out" request message to the PSTN switch. The PSTN switch application routes new calls through other gateways on the network. When the total number of available B channels returns to at least 10, the Gateway sends a "busy out" cancellation message to the PSTN switch indicating the restored ability to receive calls. The PSTN switch makes the "busied out" lines available and attempts attempt to route new calls through the Gateway.

Table 3-16 Advanced Settings—General

Field or Check Box	Description
Restrict Gateway use to MCU conferences only	Select for the Gateway to send and receive calls to and from an MCU only. This setting, together with a scheduling server, reserves resources for scheduled conferences only.
Support Presentation Restriction	Select to enable support for the presentation restriction feature. This feature responds to an instruction from the calling endpoint to forward or to conceal the endpoint identifier.
Support H.239	Select to enable support for dual video channels using the H.239 protocol. This setting is selected by default. When selected, the Gateway supports H.239 in ISDN-to-IP calls and in IP-to-ISDN calls. The Gateway identifies the protocol version that an IP endpoint uses and sends H.239 capabilities only to those endpoints working with protocol version 4.0 or later. H.239 support has no impact on Gateway capacity. We recommend that you do not enable this feature if you establish communication with endpoints that do not support H.245 generic capabilities (endpoints based on H.323 version 2 or earlier) as this might cause the endpoints to fail upon receiving these capability exchanges.

ABOUT DTMF SETTINGS

Aethra Gateway Gateways perform Dual Tone Multi-Frequency (DTMF) detection on IP-to-ISDN calls and on ISDN-to-IP calls. The Gateway can send DTMF tone information to the IP endpoint in-band only, or both in-band and out-of-band. The Gateway sends DTMF tone information to the ISDN endpoint in-band only.

Note For Aethra P20, enabling DTMF detection for video calls reduces the number of supported calls at 128 Kbps from 30 to 22 when using an E1 connection. Capacities are lower when using a T1 connection

About DTMF

The signal generated by a DTMF encoder is a direct algebraic summation, in real time, of the amplitudes of time sine (or cosine) waves of different frequencies.

An example of the use of DTMF is in touch tone telephone dialing. DTMF tones are sent out as you dial. For example, pressing “1” sends a tone created by combining frequencies of 1209 Hz and 697 Hz.

The touch tone system uses pairs of tones to represent the various keys on the telephone. A “low tone” and a “high tone” are associated with each button (0-9, *, and #). The low tones vary according to the horizontal row in which the tone button is located in Table 3-17. The high tones correspond to the vertical column in which the tone is located. The local telephone company receives each pair of tones, decodes the number dialed and makes the connection.

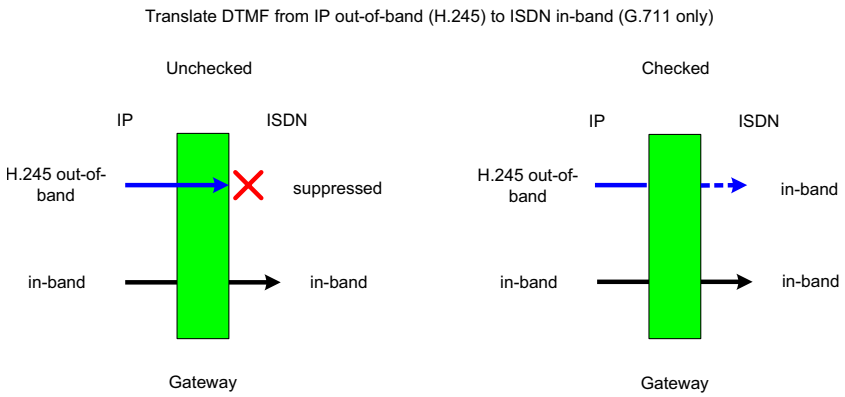
Table 3-17 *DTMF Tone Assignments*

	1209 Hz	**1336 Hz**	**1477 Hz**	**1633 Hz**
697 Hz	1	ABC 2	DEF 3	A
770 Hz	GHI 4	JKL 5	MNO 6	B
852 Hz	PRS 7	TUV 8	WXY 9	C
941 Hz	*	oper 0	#	D

About DTMF Detection on IP-to-ISDN Calls

The Gateway passes incoming in-band DTMF signals to the ISDN-side endpoint unchanged. In addition, you can configure the Gateway to convert H.245 out-of-band DTMF signals from the IP side to in-band signals on the ISDN side. Figure 3-3 illustrates IP-to-ISDN DTMF processing.

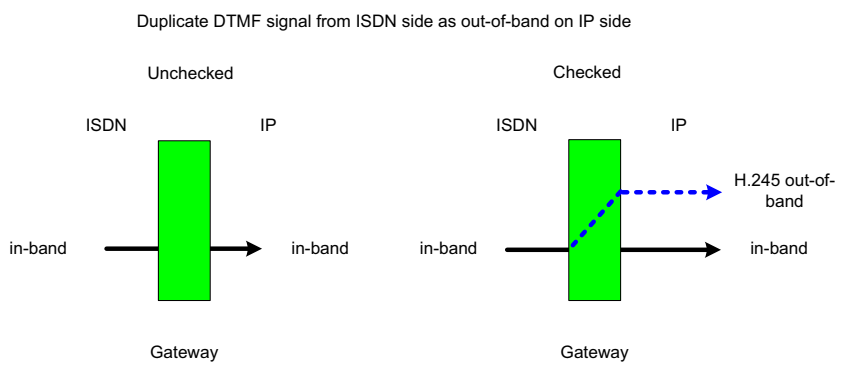
Figure 3-3 *IP-to-ISDN DTMF Processing*



About DTMF Detection on ISDN-to-IP Calls

The Gateway passes incoming in-band DTMF signals to the IP-side endpoint unchanged. In addition, you can configure the Gateway to convert in-band DTMF signals from the ISDN side to H.245 out-of-band signals on the IP side. Figure 3-4 illustrates ISDN-to-IP DTMF processing.

Figure 3-4 *ISDN-to-IP DTMF Processing*



CONFIGURING DTMF SETTINGS

You can enable DTMF detection and settings in the **Advanced** section of the **Settings** tab.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Advanced** button.
4. In the **IP to ISDN Calls** section of the PRI gateway and the BRI Gateway, you can select the **Translate DTMF from IP out-of-band (H.245) to ISDN in-band (G.711 only)** check box.

   When selected, the Gateway performs the following:

   - Converts H.245 out-of-band DTMF signals coming from the H.323 IP-side endpoint to in-band signals on the ISDN side.
   - Passes incoming in-band DTMF signals to the ISDN-side endpoint unchanged.

   This setting is selected by default. If deselected, the Gateway passes in-band DTMF signals to the ISDN-side endpoint unchanged.
5. In the **ISDN to IP Calls** section of the PRI gateway and the BRI Gateway, you can select the **Duplicate DTMF signal from ISDN side as out-of-band on IP side** check box.

   When selected, the Gateway performs the following:

   - Converts in-band DTMF signals from the ISDN-side endpoint to out-of-band H.245 signals if the IP-side endpoint is located on an H.323 network.
   - Passes incoming in-band DTMF signals to the IP-side endpoint unchanged.

   This setting is selected by default. If deselected, the Gateway passes in-band DTMF signals to the IP-side endpoint unchanged. If you do select this setting, perform step 6.
6. In the **Apply to** field of the PRI gateway and the BRI Gateway, choose the type of calls to which ISDN-to-IP DTMF

processing applies: **Voice calls** or **Voice and video calls**. **Voice calls** is the default setting.

Remember Enabling DTMF detection for PRI gateway video calls reduces the number of supported calls at 128 Kbps from 30 to 22.

Configuring Advanced Commands

You can send text-based commands to the Gateway for enhanced control. You can use these advanced commands to change certain settings in real time and monitor information such as debug information. Advanced commands are not case sensitive.

Table 3-18 describes common advanced commands.

Table 3-18 *Advanced Command Settings*

Command	Description
AddService2SrcNum	Notifies the IP endpoint of the Gateway service number to which the ISDN-side endpoint has called. Parameters: disable/enable.
CallSignalPort	Notifies the gatekeeper to which the Gateway is registered on which port to communicate. Parameters: 1000 to 3000. Remarks: The number must be unique and not used for any other purpose.
DownSpeed	Instructs the Gateway to support downspeeding. Parameters: disable/enable.

Table 3-18 *Advanced Command Settings (continued)*

Command	Description
EnhancedBillingForVoiceCalls	Instructs the Gateway to support the Aethra Aethra Gatekeeper CDR *Real Connect Time* field. *Real Connect Time* indicates the actual time at which an IP-to-ISDN voice call connects to the ISDN terminal. When disabled, the Aethra Gatekeeper uses the *Connect Time* field for CDR billing purposes. *Connect Time* indicates the time at which the Connect message is sent to the source endpoint. Parameters: disable/enable. Remarks: Default value is disable. Relevant to voice calls only. Operational only when the Gateway is registered to an Aethra Gatekeeper working in Routed Mode.
ForceG711ForMcu	Instructs the Gateway to open only a G.711 channel in Gateway-to-MCU calls. Parameters: disable/enable.
NotifyLevel	Changes the type and number of debug messages that are generated. Parameters: 0—Disables Gateway logs. 3 (default)—Fatal error (Gateway can no longer provide service), a problem affecting user functionality (for example, call connect failure or no resources available), or status prints for Customer Support use. 6—Debugging. 8—Extended debugging. Remarks: We recommend that you do not exceed a NotifyLevel of 6 as this might overload the system with a very large debug message output. Level 3 should be sufficient for normal usage.
Peer-to-Peer disconnect reason add	Instructs the Gateway under which circumstances to reroute a call to different peer device. Parameters: Enter a number representing the required H.323 call disconnect reason, as listed in Table 3-6.

Table 3-18 Advanced Command Settings (continued)

Command	Description
Peer-to-Peer disconnect reason remove	Deletes the H.323 Call Disconnect Reason set by the Peer-to-Peer disconnect reason add advanced command. Parameters: ALL—Enter a number representing the required H.323 call disconnect reason, as listed in Table 3-6.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Settings** tab.
3. Click the **Advanced** button.
4. Click **Commands**.

   The **Advanced Commands** dialog box appears.
5. Configure an advanced command by one of the following methods:
   - In the **Command** field, enter a command.
   - In the **Parameters** field, enter the parameters for the command.

   —or—
   - In the **Available commands** field, select one of the advanced commands.
   - In the **Available parameters** field, choose from one of the parameters that appears.
6. Click **Send**.

   In the **Response** field, the Gateway indicates whether it received and executed the command. If you send an invalid command, an “Unknown Command” message appears.

About Gateway Services

Gateway services are the mechanism that allows IP network endpoints to choose the type of connection they want to establish with a terminal or telephone on a circuit-switched network. A Gateway service defines the maximum bit rate for each channel, the media content of the stream (voice or data), and the mode of the call (restricted or non-restricted).

A service prefix identifies a service. The service prefix is an identifier string that can have up to 31 characters. Valid characters are 0 to 9, pound (#), asterisk (*), or comma (,). You access a service by dialing the service prefix before the phone number of the destination. For example, 9* would be identified by the Gateway as a service prefix if you dialed 9*5673994.

Note If the **Ignore caller bearer rate and force service rate** setting in the **Advanced** section of the **Settings** tab is selected, a service uses the defined bit rate. If the **Ignore caller bearer rate and force service rate** setting is deselected, the bit rate defined in the service serves as the maximum limit for the service.

The Gateway has two types of services: default and user-defined. Default services come pre-configured on the Gateway. User-defined services are services that you can define at any time using the Gateway interface. Upon registration with a gatekeeper, the Gateway provides the gatekeeper with a list of Gateway services.

The following topics discuss how you can configure services in the **Services** tab:

- Viewing Existing Services on page 86
- Adding or Editing Services on page 87
- Deleting Gateway Services on page 89

Viewing Existing Services

The **Services** tab in the Gateway interface displays a list of currently defined services for the Gateway in a table format with the following columns and fields:

- **Prefix**—Displays the prefix that identifies the service.
- **Description**—Description of the service.
- **Call Type**—Media type of the call.
- **Bit Rate**—Total bandwidth requested for the service.

- **PRI Port 1** or **2**/**BRI Port 1** to **4**—Indicates whether or not the service is enabled for the specified port.
- **Total**—Displays the total number of services currently defined in the Gateway.

Adding or Editing Services

In the **Services** tab, you can add a new service or edit an existing one.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Services** tab.
3. To add a new service, click **Add**. To edit an existing service, select it and then click **Edit**.
4. In the **Prefix** field, enter or edit the prefix number of the service. The prefix can be up to 31 characters long. Valid characters are 0 to 9 and pound sign (#), asterisk (*), and comma (,).

Note Since the comma cannot be used in the **Party number** field of the Aethra MCU Conference Control interface, we recommend that you do not use the comma as a prefix in Gateway fields.

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5. In the **Description** field, enter or edit the description of the service (up to 31 characters in length).
6. In the **Call type** field, select the call type for this service: **Video** or **Voice**.
7. In the **Bit rate** field, select the maximum bit rate you want for this service. If you select **Auto**, the Gateway determines the

ISDN call rate according to the bearer capability received in the setup message from the IP network endpoint.

Note The **Auto** setting is for video calls only.

If the IP network endpoint has a configured bit rate that is not one of the options listed in this field, the Gateway uses the default bit rate configured in the **Default Service Bit Rate** field in the **Advanced** section of the **Settings** tab.

Note If the **Ignore caller bearer rate and force service rate** field is selected when you define a bit rate for a service, the service uses the defined bit rate. If the **Ignore caller bearer rate and force service rate** is deselected, the bit rate you define serves as the maximum limit for that service.

Related Topics

- Bonding Synchronization

Bonding Synchronization

The **Advanced** dialog box enables you to configure a bonding synchronization setting for the specified service.

Procedure

1. Send the ServiceOption advanced command with a parameter of *enable to* activate the **Advanced** button.

   For information on sending advanced commands, see Configuring Advanced Commands on page 83.
2. Click **Advanced** to configure bonding synchronization settings.

   The **Advanced** dialog box appears.
3. In the **Bonding Synchronization** field, choose a bonding synchronization setting. Select **Prolong** only for endpoints that use non-standard synchronization mechanisms.

4. Click **OK** to save your setting and close the **Advanced** dialog box.
5. Click the **Port Specific** tab.
6. In the **Enable service in ports** section, select the BRI or PRI ports that are enabled for this service.
7. Click **OK**.

   The Gateway interface uploads your settings to the services database.

Deleting Gateway Services

In the **Settings** tab, you can delete existing services.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the **Services** tab.
3. Select a service and click **Delete**.

Configuring Port Settings

In the **PRI Port** or **BRI Port** tabs, you can configure physical line settings for Gateway ports. The following topics discuss the settings you can configure.

- Configuring Basic Port Settings on page 90
- Configuring Port Physical Interface Settings on page 91
- About Advanced ISDN Settings for PRI Gateways on page 97
- Configuring Port Call Policies on page 108
- Configuring Port Supported Services on page 109

Note Some configuration options are unavailable in Gateways that support only one PRI port.

Configuring Basic Port Settings

In the **Basics** section of the **PRI Port** or **BRI Port** tabs, you can configure basic settings for the specified port.

Note (PRI gateways only) A frame alignment failure message will appear when you enable a port that is not in use (no cable is attached to the PRI line connector).

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the applicable **PRI Port** or **BRI Port** tab.
3. Select the **Port enabled** check box to enable this port. For PRI gateways, if this setting is deselected, the CD LED light on the rear panel of the Gateway is disabled.
4. (PRI gateways only) In the **Port phone numbers** section, choose one of the following option buttons:
   - **Single Number**—Defines a single number for this PRI port. Enter a phone number in the field.
   - **Range**—In the two fields, enter a range of numbers for this PRI line. If the line has a range of numbers, you only need to enter the digits necessary to indicate the range. For example, if the phone numbers assigned to this line are 6775380 to 6775411, enter 380-411. You can type a maximum of 31 digits in each text field.
5. (PRI gateways only—optional) In the **Local Area Code** field, enter the local area code for the phone numbers. You can enter up to 16 digits.
6. (PRI gateways only—optional) Select the **Strip Local Area Code** check box if you want the Gateway to strip local area codes for outbound calls to the ISDN network.

Note The type of line connected to this PRI or BRI port appears in the **Physical standard** field.

Configuring Port Physical Interface Settings

This section describes the available configuration options for Gateway ports.

- PRI Ports
- BRI Ports

PRI Ports

Note This section applies only to Aethra P20.

In the **Physical Interface** section of the **PRI Port** tabs, you can configure the physical line properties of the specified PRI port.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the applicable **PRI Port** tab.
3. Click the **Physical Interface** button.
4. Select the **Same as Port** check box if you want to duplicate physical interface settings from another PRI port that you choose from the field. When selected, you cannot modify any settings in this section. This option is not available in Gateways that support only one PRI port.
5. In the **Interface** field, choose the line interface: **T1** or **E1**.
6. In the **Country** field, choose the nation where the ISDN service is installed.
7. In the **Signaling protocol** field, choose the signaling protocol used to set up and tear down the calls through the signaling (D) channel. Depending on the interface used, different signaling protocols are available.
8. In the **Network access** field, choose the Gateway national access type: **TE** (Terminal Equipment) or **NT** (Network Terminator) device.
9. In the **Clock source** field, choose the Gateway clock source:
   - **Master** (the Gateway provides the clock signal)

- **Slave** (the Gateway receives the clock signal)

10 In the **Line Build Out** field, choose **Long Haul** or **Short Haul**.

Note You can configure this setting only if you select **Japan** in the **Country** field. Skip to step 4 otherwise.

Related Topics

- Configuring Fractional Channels
- Configuring Line Coding, Framing and Signaling Type

Configuring Fractional Channels

In the **Physical Interface** section of the **PRI Port** tabs, you can configure fractional channels as part of the physical line properties of the specified PRI port.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the applicable **PRI Port** tab.
3. Click the **Physical Interface** button.
4. Click **Fractional** to select fractional channels.

   The **Fractional** dialog box appears.
5. Select the **Fractional line** check box to enable the fractional selection of channels.
6. In the **Select the channels** field, select the check boxes for the individual channels you want to use for fractional E1 or T1

distribution. The table contains 24 check boxes for T1 or 31 check boxes for E1.

Note You cannot select channel 24 of the T1 settings and channel 16 of the E1 settings. These are reserved as the signaling (D) channels that are essential for communication.

Note You can click **Select All** to select all fractional channels or **Deselect All** to deselect all fractional channels.

7 Click **OK** to close the **Fractional** dialog box.

Configuring Line Coding, Framing and Signaling Type

In the **Physical Interface** section of the **PRI Port** tabs, you can configure coding, framing, and signaling type settings as part of the physical line properties of the specified PRI port.

Procedure

1 In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2 Click the applicable **PRI Port** tab.
3 Click the **Physical Interface** button.
4 Click **Advanced** to configure line coding, framing, and signaling type.
The **Advanced** dialog box appears.
5 In the **Line coding** field, choose the type of modulation used to encode the data.
6 In the **Framing** field, choose the framing and error detection method.

Note The **ESF CRC6JT** framing option is available only if you select **Japan** in the **Country** field and **Long Haul** in the **Line Build Out** field.

7 In the **Signaling type** field, choose the signaling type.

8 Click **OK** to close the **Advanced** dialog box.

BRI PORTS

Note This section applies only to Aethra B40.

In the **Physical Interface** section of the **BRI Port** tabs, you can configure the physical line properties of the specified BRI port.

Procedure

1 In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).

2 Click the applicable **BRI Port** tab.

3 Click the **Physical Interface** button.

4 Select the **Same as Port** check box if you want to duplicate physical interface settings from another BRI port that you choose from the field. When selected, you cannot modify the **Signaling Protocol** or **Country** settings. This setting is selected by default.

5 In the **Country** field, choose the country where the ISDN service is installed.

6 In the **Signaling Protocol** field, choose the signaling protocol used to setup and tear down calls through the signaling (D) channel. Depending on the interface used, different signaling protocols are available for selection.

7 In the **PCM Audio Format** field, choose the desired G.711 audio standard: **A-Low** or **U-Low**.

Note You can only configure this setting if you select **Taiwan** in the **Country** field. Skip to step 8 otherwise.

8 In the **Directory Numbers** section, enter the phone numbers for the BRI line in the **Number 1** and **Number 2** fields.

9 Click **Advanced** to enable or disable alerting, Layer 1 line hunting, or configure a static Terminal Equipment Identifier (TEI).

The **Advanced** dialog box appears.

10 Select the **Enable Alerting** check box for the Gateway to connect a voice call that is not rejected (instead of sending alert messages to the caller).

The alerting feature is relevant for incoming voice calls routed directly to an endpoint (through DID) or to a default extension. When you select this option, the Gateway sends an alert message to the dialing ISDN terminal if the call is not connected within a few seconds. This informs the ISDN terminal that the call is not yet connected to the local IP endpoint. As a result, the ISDN terminal continues to hear a ringing sound until the Gateway connects to the call.

Note The Gateway connects the call even if the endpoint on the local IP network has not yet accepted it. If the IP endpoint does not accept the call, the call is rejected and immediately disconnects from the ISDN terminal.

This setting is selected by default. Deselect it to prevent the Gateway from sending an alert message.

11 Select the **Enable Layer 1 Line Hunting** check box if you do not want the Gateway to hunt BRI lines whose Layer 1 is not activated. This setting is deselected by default.

Note In European networks, Layer 1 is usually only activated during a call. In such a system, Layer 1 line hunting is not effective and should not be enabled. However, when the Gateway BRI port is connected to a private branch exchange (PBX) for some PBXs, Layer 1 always activates.

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12 Select the **Enable static TEI** check box to configure a static TEI. TEI values are supplied by the telecom company. If you select this option, perform step 13. Otherwise, skip to step 14.

Note You can only configure this setting if you select **5ESS PTP** or **ETSI PTP** in the **Signaling Protocol** field of the **Physical Interface** section.

13 In the **TEI Value (0-63)** field, enter a value from 0 to 63 for this BRI line.

14 Click **OK** to upload your changes to the Gateway database and close the **Advanced** dialog box.

Related Topics

- Configuring Service Profile Identification (SPID) Values

Configuring Service Profile Identification (SPID) Values

In the **Physical Interface** section of the **BRI Port** tabs, you can configure Service Profile Identification (SPID) values as part of the physical line properties of the specified BRI port.

Procedure

1 In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).

2 Click the applicable **BRI Port** tab.

3 Click the **Physical Interface** button.

4 Click **SPIDs** to configure Service Profile Identification (SPID) values for this BRI line. The SPID value is provided by the telecom company and indicates which services a specified BRI

line supports (for example, phone, fax, or videoconferencing facilities).

Note You can only configure SPID values if you select **DMS100**, **National ISDN**, or **5ESS Custom/Multipoint** options in the **Signaling Protocol** field of the Physical Interface section, and when the **Country** field is set to **US**. Skip to step step 9 otherwise.

The **SPIDs** dialog box appears.

5 In the **Number of SPIDs** field, choose the required number of SPID values.

6 In the **SPID 1** field, enter the first SPID value.

7 In the **SPID 2** field, enter the second SPID value.

8 Click **OK** to upload these changes to the Gateway database and close the SPIDs dialog box.

About Advanced ISDN Settings for PRI Gateways

Note This section applies only to Aethra P20.

In the **Advanced ISDN** section of the **PRI Port** tabs, you can view and configure ISDN settings for Aethra P20. Table 3-19 explains the information that this tab displays.

Table 3-19 *Advanced ISDN Tab Details*

Column or Field	Description
Prefix	Displays the prefix of the advanced ISDN entry.
Description	Displays a brief description of the advanced ISDN entry.
NPI	Displays the Numbering Plan Identification (NPI) classification for the ISDN phone number.
TON	Displays the Type of Number (TON) code for the advanced ISDN entry.

Table 3-19 Advanced ISDN Tab Details (continued)

Column or Field	Description
NSF	Indicates whether the Network Specific Facility feature is enabled or disabled for the Advanced ISDN entry.
Max Digits	Displays the maximum number of digits allowed for outbound dialing.
DN Manipulation	Indicates whether advanced ISDN prefix number is enabled. For default prefix entries where TON is local, this field indicates whether the DN Manipulation setting is set to **Append Local Area** Code in the **Add** or **Edit ISDN Information Elements** dialog box (see Adding or Editing ISDN Information Elements on page 104 for more information).
Total	Displays the total number of ISDN information elements currently listed in the Gateway database.

The following topics discuss how you can configure Advanced ISDN Settings:

- About NSF Settings on page 98
- Adding or Editing ISDN Information Elements on page 104
- Deleting ISDN Information Elements on page 108

Note You can select the **Same as Port** check box and select another PRI port to duplicate advanced ISDN settings from that port. When you select this option, you cannot make any edits to the configuration settings. This option is unavailable in Gateway that support only one PRI port.

About NSF Settings

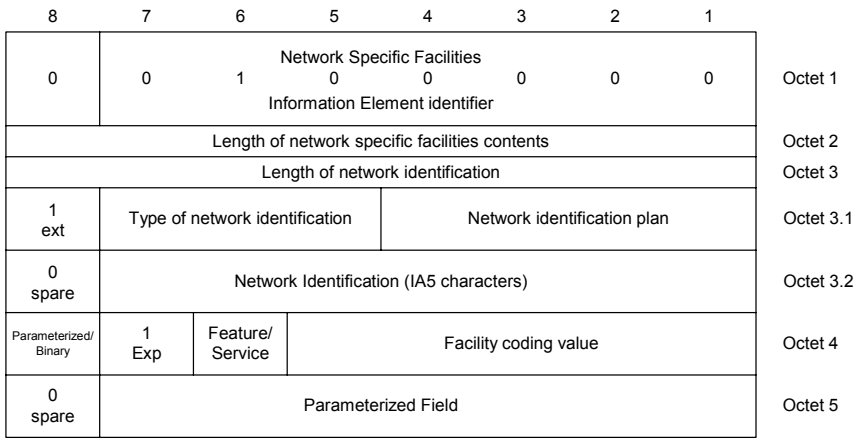
The NSF Information Element (IE) feature enables system administrators to coordinate network and service requirements with service providers. Service providers supply the information that you enter in the **NSF Configuration** dialog box. System administrators can either select any of the pre-configured NSF settings, or choose to configure their own NSF Information Element using service provider information.

You can specify the following information in the NSF:

- The service providers with which you want their network to work.
- The specific network plan and equipment with which you want your network to work (for example, switches and bandwidth).
- The specific services available to their network (for example,1-800 phone numbers).

Instructions are contained in the NSF IE fields of outgoing Q.931 setup messages in the format shown in Figure 3-5.

Figure 3-5 *Network Specific Facility Information Element Format*


8 7 6 5 4 3 2 1
0 0 1 0 0 0 0 0 Network Specific Facilities Information Element identifier Octet 1
Length of network specific facilities contents Octet 2
Length of network identification Octet 3
1 ext Type of network identification Network identification plan Octet 3.1
0 spare Network Identification (IA5 characters) Octet 3.2
Parameterized/ Binary 1 Exp Feature/ Service Facility coding value Octet 4
0 spare Parameterized Field Octet 5

NSF Information Elements contain a number of configurable **Octet** fields. The values entered in these fields represent instructions contained in outgoing Q.931 Setup messages. Figure 3-5 represents the format of such instructions. Table 3-20 describes the function of each of the **Octet** fields.

Table 3-20 *Octet Field Functions*

Octet	Function
Octet 3	Octet 3 represents the total number of Octet 3.X fields required for the specific information element, including the Octet 3 field itself.

Table 3-20 Octet Field Functions (continued)

Octet	Function
Octet 3.1	Octet 3.1 is used to hold Numbering Plan Identification (NPI) and Type of Network (TON) values. The octet contains eight bits numbered from 1 to 8 and from right to left, so that Bit 1 is rightmost and Bit 8 is leftmost. The bits contain binary values representing the following functions: ■ Bits 1-4 = NPI ■ Bits 5-7 = TON ■ Bit 8 is always set to 1 when Octet 3.1 is used and populated. **Note** The **Numbering Plan Identification (NPI)** and **Type of Network (TON)** fields appear in the **Add ISDN Information Elements** dialog box The standard NPI values are: ■ For an NPI setting of Unknown, the standard integer value is 0 and the standard binary value is 0. ■ For an NPI setting of ISDN/Public, the standard integer value is 1 and the standard binary value is 0001. ■ For an NPI setting of Private, the standard integer value is 9 and the standard binary value is 1001. The standard TON values are: ■ For a TON setting of unknown, the standard integer value is 0 and the standard binary value is 0. ■ For a TON setting of International, the standard integer value is 1 and the standard binary value is 0001. ■ For a TON setting of National, the standard integer value is 2 and the standard binary value is 0010. ■ For a TON setting of Network, the standard integer value is 3 and the standard binary value is 0011. ■ For a TON setting of Local, the standard integer value is 4 and the standard binary value is 0100.

Table 3-20 *Octet Field Functions (continued)*

Octet	Function
Octet 3.2	Octet 3.2 is used to hold information including Carrier Identification Codes (CIC). A CIC is three-digit number used to access the switched services of a particular long-distance carrier from a local exchange line. All long-distance carriers, and many long-distance resellers, have their own unique CIC. One or more CIC codes are assigned to each carrier. Some examples of CIC are: ■ MCI VNET: 222 ■ AT&T Communications: 288 ■ Sprint: 333
Octet 4	Octet 4 is used to hold information representing coding values for features and services. Service providers supply the coding values. The octet contains eight bits numbered from 1 to 8 and from right to left, so that Bit 1 is rightmost and Bit 8 is leftmost. The bits contain values representing the following functions: ■ Bits 1-5=The binary Facility Coding Value for the specified feature or service. ■ Bit 6 indicates whether the facility is a feature or a service: ▫ 0=The requested facility is a feature. ▫ 1=The requested facility is a service. ■ Bit 7 is always set to 1 ■ Bit 8 indicates whether the requested facility has associated parameters or is binary: ▫ 0=There are parameters associated with the requested facility and they are specified in Octet 5. ▫ 1=The requested facility is a binary facility. There are no parameters.
Octet 5	Octet 5 is used to hold information representing coding values for parameterized facilities. The octet contains eight bits numbered from 1 to 8 and from right to left, so that Bit 1 is rightmost and Bit 8 is leftmost. The bits contain values representing the following functions: ■ Bits 1-7 represents the parameterized field coding value. ■ Bit 8 is for future use.

Table 3-21 shows Octet 4 binary facility coding values for specified features when Bit 6 is set to 0. Table 3-22 shows binary facility coding values for specified services when Bit 6 is set to 1.

Table 3-21 *Feature Binary Facility Coding Values*

Bits					Feature
5	**4**	**3**	**2**	**1**	
0	0	0	0	1	Calling party number preferred
0	0	0	1	0	Billing number preferred
0	0	0	1	1	Calling party number only
0	0	1	0	0	Billing number only
0	0	1	0	1	Operator
0	0	1	1	0	Pre-subscribed Common Carrier Operator
0	0	1	1	1	Reserved
0	1	0	0	1	Call-Associated Temporary Signaling Connection (TSC)
0	1	0	1	0	Notification of Call-Associated TSC clearing
0	1	0	1	1	Reserved
0	1	1	0	0	Reserved
1	0	0	0	0	Reserved

Table 3-22 *Service Binary Facility Coding Values*

Bits					Feature
5	**4**	**3**	**2**	**1**	
0	0	0	0	1	Software Defined Network (SDN). Includes Global SDN)
0	0	0	1	0	AT&T Megacom

Table 3-22 *Service Binary Facility Coding Values*

Bits					Feature
5	**4**	**3**	**2**	**1**	
0	0	0	1	1	AT&T Megacom
0	0	1	0	0	Reserved
0	0	1	0	1	Wide Area Telecommunications Service (WATS)
0	0	1	1	0	AT&T Accunet Switched Data Video Gateway (SDVG)
0	0	1	1	1	Long Distance Service
0	1	0	0	0	International 800 (1800)
0	1	0	0	1	Reserved
0	1	0	1	0	Reserved
0	1	0	1	1	Reserved
0	1	1	0	0	Reserved
1	0	0	0	0	Multiquest
1	0	0	0	1	Reserved
1	0	0	1	0	800
1	0	0	1	1	Test call
1	0	1	0	0	Inward Wide Area Telecommunications Service (INWATS)
1	0	1	0	1	SDN-K (Key Service Protection)
1	0	1	1	1	Call Redirection Service

Table 3-23 shows Octet 5 parameterized facility coding values.

Table 3-23 *Parameterized Field Binary Coding Values*

Bits							Parameterized Field
7	**6**	**5**	**4**	**3**	**2**	**1**	
0	0	0	0	0	0	1	Alternate handling on Ring/No Answer
0	0	0	0	1	1	0	Sponsor Flexible Rating (SFR)
0	0	0	1	1	0	0	Out-of-band triggers allowed—data allowed
0	0	0	1	1	0	1	Out-of-band triggers allowed—data not allowed
0	0	0	1	1	1	0	Network Managed Data
0	0	0	1	1	1	1	Switched Data Video Gateway (SDVG) Service

Adding or Editing ISDN Information Elements

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the applicable **PRI Port** tab.
3. Click the **Advanced ISDN** button.
4. Click **Add** to add a new ISDN information element or select an existing one and click **Edit** to modify it.

   The **Add** or **Edit ISDN Information Elements** dialog box appears.
5. In the **Prefix** field, enter or edit the prefix for the ISDN information element. If you set this field to **Default**, it cannot be edited after you create the element.

6 In the **Description** field, enter or edit the description of the ISDN information element. If you set this field to **Default**, it cannot be edited after you create the element.

7 In the **Numbering Plan Identification (NPI)** field, choose an NPI code for the ISDN information element.

8 In the **Type of Number (TON)** field, choose a TON code for the ISDN information element.

9 In the **Maximum digits send** field, enter the number of digits (up to a maximum of 32) allowed for outbound dialing.

10 In the **DN Manipulation** field, you can configure the stripping of the ISDN information prefix number from the outbound dialed number.

The options in this field vary according to the options set in the Prefix and Type of Number (TON) fields. Table 3-24 details the possible variations

Table 3-24 *DN Manipulation Option Variations*

Prefix Field	Type of Number (TON) Field	DN Manipulation Options
Default	Local	None, Append Local Area Code
Default	Any except Local	None
Any except Default	Any	None, Strip Prefix

You are now ready to configure your required Network Specific Facility settings (see Configuring Network Specific Facility Settings).

Configuring Network Specific Facility Settings

This section describes how to complete the procedure that you began in Adding or Editing ISDN Information Elements.

Procedure

1 In the **Network Specific Facility (NSF)** field, make one of the following selections:

- Choose one of the pre-configured settings or choose **None** to not configure any NSF information elements. Table 3-25 lists the pre-configured settings.

Table 3-25 *Pre-configured NSF Settings*

Pre-configured Setting	Information Element (IE) Octets								
	IE 1 Octets						IE 2 Octets		
	3	3.1	3.2	3.2	3.2	4	3	4	5
AT&T Accunet	4	A1	32	38	38	E6			
AT&T Megacom	4	A1	32	38	38	E3			
AT&T Megacom 800	4	A1	32	38	38	E2			
AT&T SDDN	4	A1	32	38	38	E1			
AT&T Accunet + SDVG	4	A1	32	38	38	E6	0	49	0F
AT&T Megacom + SDVG	4	A1	32	38	38	E3	0	49	0F
AT&T Megacom 800 + SDVG	4	A1	32	38	38	E2	0	49	0F
AT&T SDDN + SDVG	4	A1	32	38	38	E1	0	49	0F
MCI VNET	4	A9	32	32	32	E1			
Sprint VPN	4	A9	33	33	33	E1			

—or—

- Choose **Custom**.

- Click **Configure**.

  The **NSF Configuration** dialog box appears. You can configure up to four NSF information elements.

Note You can only configure the NSF information elements (NSF IEs) if you set the **Interface** field in the **Physical Interface** section of the **PRI Port** tabs to **T1** and set the **Country** field to **US**. All outgoing Q.931 setup messages will contain the NSF IE.

- Select the **Enable** check box.
- In the **Octet 3** field, choose a value. When the value is greater than 0, that number of fields appears beneath the Octet 3 field. If this field is set to **0**, the Octet 3.1 and Octets 3.2 fields are not available. If this field is set to **1**, only the Octet 3.1 field is available.
- In the **Octet** field(s), choose settings.
- In the **Type** field, choose **Binary feature** or **Binary service** and then in the **Facility Coding Value** field, enter a value.

  —or—

  In the **Type** field, choose **Parameterized** and then in the **Parameterized Field** field, enter a value.

  —or—

  In the **Type** field, choose **Custom** and then in the **Octet 4** and **Octet 5** field (if applicable), enter a value.

Note When you select **Binary feature** or **Binary service** in the **Type** field, the **Facility Coding Value** field is for Octet 4, Bits 5-1. When you select **Parameterized** in the **Type** field, the **Parameterized Field** field is for Octet 5, Bits 7-1. When you select **Custom** in the **Type** field, the values entered in the **Octet 4** or **Octet 5** fields are not subject to bit restriction.

- Repeat step 1 for as many additional NSF information elements as necessary.

Deleting ISDN Information Elements

In the **Advanced ISDN** section of the **PRI Port** tabs, you can delete an ISDN information element.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the applicable **PRI Port** tab.
3. Click the **Advanced ISDN** button.
4. Select an ISDN information element and click **Delete**.

Configuring Port Call Policies

In the **Call Policies** section of the **PRI Port** or **BRI Port** tabs, you can configure the incoming call routing methods available in the Gateway for each specified port. You can define each port with different settings.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the applicable **PRI Port** or **BRI Port** tab.
3. Click the **Call Policies** button.
4. Select the **Same as Port** check box to duplicate call policies settings from another Gateway port that you choose from the field. When selected, you cannot modify any settings in this section. This option is unavailable in Gateways that support only one PRI port.
5. In the **Enable inbound routing methods** section, you can select incoming call routing methods in the following order of priority:
   - **DID**—When selected, enables Direct Inward Dialing to an endpoint.
   - **TCS4**—When selected, enables TCS4 dialing. This setting does not apply to voice calls.
   - **IVR**—When selected, enables the Interactive Voice Response operator.

- **Default extension**—When selected, enables the use of the default extension number that you enter in the field.

6. Select the **Overlap Receiving** check box to enable overlap receiving functionality. In this functionality, the Gateway can receive consecutive digits until the dialing is complete, instead of receiving the entire phone number as a block of digits. The Gateway recognizes that an overlap receiving dialing is completed when it receives a fixed, predefined, incoming number of digits. If the Gateway receives a complete indication notification from the switch (PSTN) or a timeout before all the digits have been dialed, the call might connect to a different address or rejected. If you select this setting, perform step 7, otherwise skip to step 8.
7. In the **Incoming number of digits** field, enter the number of digits you want the Gateway to expect during overlap receiving. The Gateway waits until this number of specified digits is received and then processes the whole number. You can enter any value up to 32.
8. In the **Outgoing Calling Party Number** field, enter a number that the Gateway automatically provides if the calling IP network endpoint does not provide a calling party number. Valid digits are 0 through 9 You can enter up to 11 digits.

Configuring Port Supported Services

In the **Supported Services** section of the **PRI Port** or **BRI Port** tabs, you can enable or disable specific Gateway services on each port. The **Supported Services** section displays the following information in table form:

- **Prefix**—Displays the prefix for this service.
- **Description**—Displays a brief description of the service.
- **Call Type**—Displays the call media type: Voice or Video.
- **Bit Rate**—Displays the maximum total bit rate allowed for this service.
- **Support**—Displays the status of the service: enabled or disabled.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. Click the applicable **PRI Port** or **BRI Port** tab.
3. Click the **Supported Services** button.
4. Select the **Same as Port** check box if you want to duplicate settings from another Gateway port that you choose from the field. When selected, you cannot modify any settings in this section. This option is unavailable in Gateways that support only one PRI port.
5. To enable or disable a service for this port, select it and click **Enable** or **Disable**.

VIEWING CALL INFORMATION

The **Calls** tab displays a list of the calls currently defined in the Gateway and the basic details of each call. The **Calls** tab displays the following information in table format:

- **Call ID**—Displays the call identifier.
- **Source Party Number**—Displays the alias that identifies the source endpoint of the call.
- **Destination Party Number**—Displays the alias that identifies the destination endpoint of the call.
- **Start Time**—Displays the time at which the call began.
- **Total Call Bandwidth**—Displays the total bandwidth (in Kbps) used for this call on both sides.
- **Encryption**—Indicates the level of encryption currently in use for the specified participant: best effort, encryption required, or strong encryption required.
- **Total**—Field indicates the total number of calls currently defined in the Gateway.

The following topics discuss the tasks you can perform in this tab:

- Refreshing Call Information on page 111
- Viewing Call Details on page 111
- Disconnecting Calls on page 113

Refreshing Call Information

You can configure the Gateway interface to refresh information that appears in the **Calls** tab every ten seconds.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. In the **Calls** tab, select the **Auto Refresh** check box.

Viewing Call Details

In the **Calls** tab, you can view detailed information for each call currently defined in the Gateway.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. In the **Calls** tab, select a call and click **Details**.

   The **Call Details** window appears. Table 3-26 explains the information that this window provides.

Table 3-26 *Call Details Window Fields*

Field	Description
Start	Displays the time at which the call began.
Duration	Displays the length of time that the call has been in progress.
Bandwidth (Kbps)	Displays the total bandwidth (in Kbps) used for this call on both sides.
Source	
Source	Indicates whether the source endpoint of the call is located on an ISDN or IP network.
Number	Displays the alias that identifies the source endpoint of the call.
B channels	Displays the B channels currently in use for this call.

Table 3-26 Call Details Window Fields (continued)

Field	Description
Resync B channels	In mid-call, you can click this button to resynchronize B channels in cases of poor call quality. Use this option with extreme caution. Resynchronizing B channels can cause a call to disconnect.
Audio	Displays the audio transcoding protocol and the bandwidth of the voice calls in both directions between the source endpoint and the Gateway.
Video	Displays the video transcoding protocol, the frame format, and the bandwidth of the video calls in both directions between the source endpoint and the Gateway. **Note** The Video 2 stream is active when dual video streams for a single call are in use.
Data	Displays the bandwidth of the data calls in both directions between the source endpoint and the Gateway.
Gateway	
Transcoded	Indicates that a call is transcoded.
Destination	
Destination	Indicates whether the destination endpoint of the call is located on an ISDN or IP network.
Number	Displays the alias that identifies the destination endpoint of the call.
Name	Displays the name that identifies the destination endpoint of the call.
IP	Displays the IP address of the destination endpoint of the call.
Packet Loss (%)	Displays the rate of packet loss in communication from the IP side of the call to the Gateway, regardless of whether the source endpoint is located on an ISDN or IP network.

Table 3-26 Call Details Window Fields (continued)

Field	Description
Encryption	Indicates the encryption algorithm in use for the call (if any).
Audio	Displays the audio transcoding protocol and the bandwidth of the voice calls in both directions between the Gateway and the destination endpoint.
Video	Displays the video transcoding protocol, the frame format, and the bandwidth of the video calls in both directions between the Gateway and the destination endpoint. **Note** The Video 2 stream is active when dual video streams for a single call are in use.
Data	Displays the bandwidth of the data calls in both directions between the Gateway and the destination endpoint.

DISCONNECTING CALLS

In the **Calls** tab, you can disconnect a currently active call or disconnect all active calls.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway** (if not already selected).
2. In the **Calls** tab, select a call and click **Disconnect**, or to disconnect all calls, click **Disconnect All Calls**.

Viewing Gateway Alarm Events

In the **Event Log** tab, you can view a list of reported alarm events. The **Event Log** tab displays the following information:

- **Event ID**—Displays the identifier for the specified alarm event.
- **Type**—Displays the type of event.
- **Time**—Displays the time at which the reported event occurred.
- **Severity**—Displays the severity of the reported event.
- **Message**—Displays the error message used to report the event.
- **Total**—Displays the total number of reported alarm events.
- **Clear All**—Click to clear all events from the **Event Log** tab.

See Table 3-8 for a list of PRI gateway SNMP events. See Table 3-9 for a list of BRI Gateway SNMP events.

Viewing Gateway Statistics

In the **Statistics** tab, you can view system-specific information such as call traces and debugging details. The **Statistics** tab displays the following:

- **Gateway start-up counter**—Displays the number of times that the Gateway has reset.
- **Details** button—Click to display the **Details** window, which lists the last three reasons for Gateway power failure.
- **ISDN LOF event counter** (PRI gateways only)—Displays the total number of ISDN Loss of Frame (LoF) errors recorded on both Gateway PRI ports.
- **CRC error/event counter on ISDN** (PRI gateways only)—Displays the total number of CRC errors on the ISDN network recorded on both Gateway PRI ports.
- **ICMP-in-message counter**—Displays the number of Internet Control Message Protocol (ICMP) packets received.
- **UDP-in-datagram counter**—Displays the number of User Datagram Protocol (UDP) packets received.
- **Packet loss counter**—Displays the number of lost packets.
- **Packet late counter**—Displays the number of late packets.
- **Accumulated time of B channel usage**—Displays the total B channel usage (in minutes).
- **Counter reset time**—Displays the last time at which the counters were reset.
- **Reset Counters** button—Click to reset all counters to zero.

Configuring Gateway Maintenance Tasks

In the **Maintenance** tab, you can enter maintenance mode. In maintenance mode, you can perform maintenance work on the Gateway, such as upgrading software. In maintenance mode, the Gateway cannot accept new calls. You can disconnect all calls currently active in the Gateway, or wait for them to disconnect. In maintenance mode, you can only modify the following configuration settings:

- Services (see About Gateway Services on page 86 for more information)
- Fractional B channel status (PRI gateways only) (see Viewing B Channel Status on page 46 for more information)
- Gatekeeper IP connectivity (see Configuring IP Connectivity Settings on page 48 for more information).
- Resource allocation
- IVR (see Configuring IVR Settings on page 55 for more information)

To enter maintenance mode, click **Enter Maintenance Mode**. To exit maintenance mode, click **Exit Maintenance Mode**.

Saving Configuration Settings

You can save Gateway configuration settings to a file and then export this file to a storage device on your network. You can use the saved configuration file to restore the settings to the current Gateway unit or to configure a similar Gateway unit.

An exported configuration file saves most of the current **Device** section settings and all of the current Gateway section settings.

Note You cannot save configuration settings in the **System** category.

You must use the **Export** button on the toolbar to save the configuration settings to a file. The **Export** button appears only when Gateway section settings are activated. When you save a configuration file, the current **Device** section settings are saved in the file. If you want to change these settings for export, click **Upload** on the toolbar to save these settings to configuration memory prior to saving the configuration file.

Procedure

1. In the Gateway interface, on the sidebar, click **Device**.
2. Make sure that the settings in the **Basics**, **Addressing**, **Web** and **Users** tabs are correct.

Note Date parameters are not saved to the configuration file.

3. Click **Upload** to save these settings.
4. On the sidebar, click **Gateway**.
5. Make sure that the settings in the **Status**, **Settings**, **PRI** or Serial **Ports**, **Calls**, **Event Log** and **Statistics** tabs are correct.
6. Click **Upload** to save these settings.
7. On the toolbar, click **Export**.

Note A dialog box appears indicating that you are navigating away from the page without saving the changes. Select the option to continue.

The **File Download** dialog box appears.

8. Save the configuration settings file to your chosen location. The file extension *.ini* is automatically appended to the file name.

IMPORTING CONFIGURATION FILES

You can import the settings of a saved Gateway unit configuration file from a storage device on your network. You can use the saved configuration file to restore the settings to the current Gateway unit or to configure another Gateway unit.

Procedure

1. In the Gateway interface, on the sidebar, click **Gateway**.
2. On the toolbar, click **Import**.

   The **Import a Configuration File** page appears.

3 Click **Browse**.

The **Choose file** dialog box appears.

4 Navigate to and select the configuration file you want to import.

Note The file must have an *.ini* extension.

5 Click **Open**.

The file path appears in the **File Name** field.

6 Click **Import**.

The file appears in the Gateway category window, and the **Upload** button is active.

Note You can open and change settings in any of the Gateway category options without losing the original settings in the configuration file. However, you must click **Upload** on the toolbar to retain these setting before selecting another category.

7 Click **Upload** to save the settings in configuration memory.

Note Uploading the file resets the device.

4

USING THE AETHRA GATEWAY

This section provides sample scenarios for using the Aethra Gateway with configuration details and dialing examples, including the following:

- About Dialing Out to the ISDN Network via the Gateway
- About Dialing In to the IP Network via the Gateway

ABOUT DIALING OUT TO THE ISDN NETWORK VIA THE GATEWAY

This section describes how to dial between IP and ISDN networks using the Gateway.

When you dial out from an IP network to an ISDN network, you dial a service prefix followed by a string that usually includes the destination area code, the destination phone number and any required extra characters such as an asterisk (*), pound sign (#) or delimiter. The service prefix indicates that the call is to go through the Gateway, and also indicates the properties of the call such as the call type or bandwidth requirements.

ABOUT GATEWAY SERVICE PREFIXES

Gateway services define different call types and bandwidths for IP network endpoints. The services are identified by service prefixes. The network administrator in charge of the H.323 network is responsible for defining services and informing users of available services. See About Gateway Services on page 86 for more information.

Note A service prefix should not be the same as the first digits of an IP endpoint phone number.

Dialing Example 1: Voice calls

The number string 912015294300 is a voice call from an IP network terminal to an H.323 endpoint on another IP network or to a terminal on the ISDN network. This number string consists of:

- 9—The service prefix for a voice call.
- 12015294300—The destination phone number including the area code.

Dialing Example 2: Voice calls with the auto bit-rate setting service

The number string 712015294300 is a voice call from an IP network terminal to an H.323 endpoint on another IP network or to a terminal on the ISDN network using a service with the bit rate setting of auto. This number string consists of:

- 7—The auto bit-rate setting service prefix for a voice call.
- 12015294300—The destination phone number including the area code.

The bit rate of the call is fixed according to the setting in the source IP network terminal.

Dialing Example 3: 1B video calls

The number string 821816455318 is a 1B video call from an IP network terminal to an H.323 endpoint on another IP network or to a terminal on the ISDN network. This number string consists of:

- 82—The service prefix for a 1B video call.
- 1816455318—The destination phone number including the area code.

About Second Number Delimiters

To dial an outgoing 2B call, you dial the service prefix for 1B calls and the two B channel phone numbers. Because some H.323 endpoints do not support dialing long number strings or two phone numbers, you can use a delimiter to indicate to the Gateway the end of one number and the beginning of the other. See Configuring Outgoing Call Delimiters on page 56 for more information.

Dialing Example 4: 2B video calls

The number string 821816455318* is a 2B video call from an IP network terminal to an H.323 endpoint on another IP network or to a terminal on the ISDN network. Both B channels have the same number. This number string consists of:

- 82—The service prefix for a 2B video call.
- 1816455318—The destination phone number including the area code.
- *—The second number delimiter. The second number delimiter tells the Gateway to dial the destination phone number a second time.

Dialing Example 5: 2B video calls

The number string 821816455318*1816455319 is a 2B video call from an IP network terminal to an H.323 endpoint on another IP network or to a terminal on the ISDN network. The B channels have different numbers (or your endpoint does not have two phone number fields). This number string consists of:

- 82—The service prefix for a 2B video call.
- 1816455318—The destination phone number including the area code.
- *—The second number delimiter.
- 1816455319—The second B channel number including the area code.

Dialing Example 6: 6B bonded high quality video calls

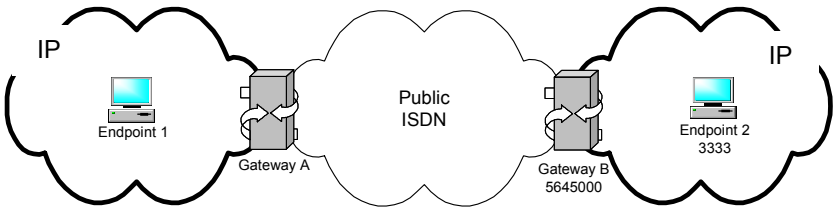
The number string 867455001 is a 6B bonded high quality video call from an IP network terminal to an ISDN network terminal. This number string consists of:

- 86—The service prefix for 6B bonded calls.
- 7455001—The phone number of the destination terminal.

Dialing Example 7: IP-ISDN-IP direct dialing—Gateway supports TCS4

The number string 9825645000^3333 is a call from an IP network endpoint (Endpoint 1) to an IP network endpoint in another zone (Endpoint 2), through a public ISDN network, as shown in Figure 4-1. Gateway A dials using TCS4, while Gateway B is set to receive calls in TCS4 mode.

Figure 4-1 *TCS4 Dialing*



This number string consists of:

- 9—The voice call service prefix in Gateway A in Zone A.
- 82—The service prefix for a 2B video call in Gateway A in Zone A.
- 5645000—The number of the destination Gateway B on the public ISDN network.
- ^—The TCS4 delimiter configured in Gateway A.
- 3333—The E.164 number of the destination IP Endpoint 2.

About Dialing In to the IP Network via the Gateway

The Gateway is responsible for routing incoming calls to the requested H.323 endpoints on the IP network.

When a terminal or phone on the ISDN network wants to reach an IP endpoint, it has to dial at least one of the phone numbers assigned to the ISDN line connected to the Gateway PRI or BRI ISDN port.

About Incoming Call Routing

When a call originating on the ISDN network reaches the Gateway, the Gateway routes it to an IP network endpoint. This is achieved through one of several incoming call routing methods that the Gateway supports. You can enable any number of routing methods for each port, but at least one method must be enabled for incoming calls to be routed through that port. The Gateway routes an incoming call from the ISDN network according to the routing methods enabled for the ISDN port, following this order of priority: DID –>TCS4 –>IVR–>Default Extension.

If a routing method fails, the Gateway automatically tries to route the call through the next routing method in line. If all methods fail, the call is rejected. The call might also be rejected if the Gateway routes the call to an endpoint that is busy or not available.

Table 4-1 explains the routing methods.

Table 4-1 *Routing Methods*

Routing Method	Explanation
DID	The Gateway supports two forms of DID (Direct Inward Dialing): Multiple Subscriber Network (MSN) and sub-addressing. ■ MSN—The telephone company assigns a group of phone numbers to a particular ISDN line by the telephone company. PRI or BRI ISDN lines are usually assigned multiple numbers in the US and in Europe. When MSN is used, an ISDN terminal or phone can dial directly to an IP network endpoint. The call is still routed through the Gateway but the Gateway is transparent to the person dialing from an ISDN terminal. An H.323 endpoint on the IP network registers with the gatekeeper using one of the MSN numbers. When an ISDN terminal dials the MSN number, the call routes through the Gateway ISDN port connected to the line with the MSN service to the endpoint that registered using the requested number. ■ Sub-addressing—Sub-addressing is a one-stage DID dialing mechanism in which a phone sends two numbers. One number is for routing on the circuit switched network. The other number is forwarded to the Gateway inside a Q.931 sub-addressing information element for IP address resolution by the gatekeeper. Sub-addressing can also be used for implementing ISDN fallback when not enough bandwidth is available for routing an IP-oriented call over IP. Implementing ISDN fallback requires the support of the gatekeeper.

Table 4-1 *Routing Methods*

Routing Method	Explanation
TCS4	TCS4 is a special routing method for incoming H.320 video calls. TCS4 allows direct inward dialing to an endpoint on the IP network through the Gateway when DID is not available. H.323 endpoints on the IP network register with the gatekeeper using extension numbers. When an ISDN terminal dials one of the Gateway phone numbers followed by a TCS4 extension, the call is routed directly to the corresponding IP endpoint registered with that extension.
IVR	IVR (Interactive Voice Response) is a widely deployed automated call answering system that responds with a voice menu allowing you to make choices for routing the call. The Gateway can operate with its own internal IVR or an external IVR located in another device. When an incoming call activates the IVR system, it initiates an interactive session with the caller. The caller directs the call to its destination endpoint by responding with the dialer to prompts from the IVR system. If the caller appropriately enters the destination endpoint phone number, the IVR connects the caller to the requested IP network endpoint. Otherwise, the call can be forwarded to an operator. The IVR call transfer is enabled by a proprietary mechanism that the Gateway uses to transfer a call from one IP network endpoint to another. The Gateway supports call transfer for incoming calls from the ISDN network to an IP network endpoint whether you are using a Aethra gatekeeper or a third-party gatekeeper. The Gateway internal IVR can handle up to 30 simultaneous incoming calls. With the Gateway, you can define an endpoint on the IP network as an IVR operator (see Configuring IVR Settings on page 55 for more information). This provides an alternative if the requested destination endpoint is not available.
Default Extension	Any endpoint on the IP network can be defined as a default destination for calls using the default extension number (including the Gateway prefix plus the H.320 or PSTN phone number) that is registered with the gatekeeper. All calls not routed through one of the above incoming call routing methods are forwarded to this endpoint.

About the IVR Operator

You can define an IP network endpoint as an IVR operator and configure the Gateway ports accordingly. See Configuring IVR Settings on page 55 for more information.

Dialing Example 8: Direct dialing to an IP network endpoint (Gateway supports DID)

The number string 5645001 is a call from an ISDN network terminal to an IP network endpoint. This number string consists of:

- 5645001—The destination endpoint phone number.

The call is routed to the requested endpoint according to its registration identity in the gatekeeper.

Dialing Example 9: Direct dialing to an IP network endpoint (Gateway supports TCS4 but not DID)

The number string 5645000^5776 is a call from an ISDN terminal to an IP network endpoint. The dialing endpoint must also support TCS4. This number string consists of:

- 5645000—The Gateway phone number.
- ^—The TCS4 delimiter of the dialing endpoint (if required).
- 5776—The extension number of the requested endpoint.

Note TCS4 only routes H.320 video calls.

About Dialing through the IVR

When the Gateway does not support DID or TCS4, you can reach an endpoint using the Interactive Voice Response (IVR) routing mechanism.

When IVR is enabled, you are answered by a recorded message prompting you to enter the destination endpoint phone number followed by the pound (#) sign. If you enter the number of an endpoint that is online and currently not busy, the IVR connects the call to the requested endpoint.

Dialing Example 10: Dialing to an IP network endpoint through the IVR

The number string 5645000 <wait for the IVR to respond> 5561# is a call through an IVR routing mechanism. This number string consists of:

- 5645000—The Gateway phone number.
- 5561—The number of the requested endpoint.
- #—This is required by the IVR for call completion.

About Dialing Indirectly through an Operator

If you do not dial the number of a destination endpoint when requested to do so by the IVR, the IVR automatically passes you to an operator. You can define any endpoint on the IP network as the IVR operator (see Configuring IVR Settings on page 55 for more information).

When IVR is enabled, you are answered by a recorded message prompting you to enter the destination endpoint phone number. If you do not know the destination endpoint number, the IVR routes the call from the Gateway using ISDN to the IP network endpoint that is defined as the IVR operator.

Dialing Example 11: Dialing to an IP network endpoint through an operator

The number string 5645000 <wait for the IVR to respond>* is a call to an IP network through an IVR operator. This number string consists of:

- 5645000—The Gateway phone number.
- *—This character is optional.

5

TROUBLESHOOTING THE AETHRA GATEWAY

This section covers problems you might encounter when configuring, operating and managing the Aethra Gateway. This chapter provides suggested actions you can use to solve the problems, and includes the following topics.

This chapter discusses the following topics:

- About Problems Encountered Setting the IP Address
- About LED Indications
- About Problems with Outbound Calls
- About Problems with Inbound Calls
- Monitoring from a Remote Site
- Using the Hyperterminal Configuration Commands

ABOUT PROBLEMS ENCOUNTERED SETTING THE IP ADDRESS

This section identifies problems that you can have assigning an IP address to a new Gateway, and suggests possible solutions.

Symptom

- Cannot access the Gateway through the serial port.
- Information from the Gateway does not appear on the terminal emulator screen.

Recommended Action

- Make sure that the terminal emulator modem is set using the parameters as follows:
  - Baud rate: 9600
  - Data bits: 8
  - Parity: None
  - Stop bits: 1
  - Flow control: None
- Make sure that the terminal cable that is shipped with the unit or a null cable is securely connected to the Gateway serial port and to the computer serial port.
- Verify that the Gateway can communicate with the terminal by using the procedure below.

Procedure

1. Launch the terminal emulation software installed on the computer you have connected to the Gateway serial port.

   A prompt appears.
2. Press **Enter**.

   If the prompt moves, the terminal emulator is communicating with the Gateway.
3. Restart the Gateway.

   A log of the start up events appears on the computer monitor.

   If nothing appears, check the cable connection between the Gateway and the computer. You must use the terminal cable that is shipped with the unit or a null cable. If the problem persists, contact Aethra Technical Support for assistance.

Symptom

The terminal emulator does not display the configuration menu.

Possible Cause

After the power to the Gateway is turned on, the terminal emulator connection displays a countdown. Pressing any key causes the Gateway to begin initialization and you see the “Main application started. Please wait ...” message. When initialization is complete the “Press any Key To start configuration ...” prompt should display.

Recommended Action

To reset the Gateway, press the **RST** button on the Gateway front panel.

About LED Indications

This section identifies problems that the LEDs can indicate, and suggests possible solutions.

Symptom

The 10/100BaseT link LED does not light up.

The 10/100BaseT link LED is embedded in the 10/100BaseT jack on your left as you face the Gateway front panel. When this LED is lit, it indicates that the Gateway is connected to the network.

Recommended Action

- Make sure that the LAN cable is connected to the 10/100BaseT-1 jack on the front panel of the Gateway.
- Make sure that the devices at both ends of the link are powered-up.
- Make sure that you use a RJ-45 jack with standard wiring to connect the LAN cable to the Gateway 10/100BaseT-1 jack.
- Reset the Gateway by pressing the **RST** button on the front panel or by clicking **Reset** in the toolbar of the Administrator interface.
- After the Gateway restarts, check the link LED.

- Perform a ping test from a PC terminal to the Gateway IP address. If the Gateway is connected to the network, the ping returns the message “Reply from …”. If the Gateway does not respond to the ping, the ping returns the message “Request timeout.”

  If you receive a “Request timeout” message, try replacing the cable and repeat the ping test. Also, make sure that you properly configure the Gateway IP address and subnet mask, and the router IP address.

Symptom Why doesn’t the GK LED light up?

Possible Cause The GK LED indicates that the Gateway has an active registration with the gatekeeper.

Recommended Action

- Make sure that you specify the gatekeeper with which you want the Gateway to register in the Gateway Administrator interface.
- Make sure that the IP address of the gatekeeper the Gateway is to register with is correct.
- Make sure that the gatekeeper is working.

Symptom Why is the ALRM LED on?

Possible Cause The ALRM LEDs light up when there is a data transmission error during a call. Errors that trigger the alarm include loss of signal, loss of frame, excessive errors and incorrect configuration.

The Gateway has an ALRM LED on the front panel and an alarm for each port on the rear panel. The ALRM LED on the front panel indicates that there is a line error. The ALRM LEDs on the rear panel are associated with an ISDN or serial line and indicate whether the error is from the LAN endpoint (local) or Public Switched Telephone Network (PSTN) endpoint (remote).

Recommended Action

- Make sure you use the correct cable.
- Make sure that the LAN cable is connected.

- Make sure that the Gateway port configuration is compatible with how the ISDN line is configured.
- If the Gateway is connected to a PBX, make sure that the PBX is properly connected and configured.
- If the Gateway is connected directly to a central office switch, make sure that the BRI service is provisioned to support the Gateway (for BRI Gateways) or that the PSTN line is configured to support the Gateway (for PRI gateways).

About Problems with Outbound Calls

This section identifies problems that users can have making calls through the Gateway and suggests possible solutions.

Symptom Why are end users unable to make outbound calls?

Possible Cause Data is not being transported to the call participants.

Recommended Action

- Make sure that the call initiator is using a valid Gateway service prefix to dial the call.
- Make sure that the call initiator is using the correct service for the call. (If the call is a voice call, the service should be configured for voice-only.)
- Make sure that the call initiator is correctly dialing the number.
- Make sure that the dialing endpoint is registered with a gatekeeper.
- For long distance calls, make sure that the BRI or PRI service is configured to support long distance calls.
- Make sure that the service is registered with the gatekeeper.

Possible Cause The BRI or PRI line might have been connected to the Gateway in the wrong order.

Recommended Action

- Make sure that the PRI or BRI lines are connected before the Gateway is turned on. If the Gateway is turned on before the lines are connected, the service is not available.

- Make sure that the terminal cable is properly connected to the Gateway. When working with an IMUX, make sure that the IMUX is properly configured.
- Reset the Gateway to activate the service.

About Problems with Inbound Calls

This section identifies problems users can have receiving calls through the Gateway, and suggests possible solutions.

Symptom Why are end users unable to receive incoming calls?

Possible Cause The Gateway might not be configured correctly.

Recommended Action

- Make sure that at least one routing method is defined for each active PRI or BRI port. See Configuring Port Call Policies on page 108 for information about configuring routing for incoming calls.
- Make sure that parameters for Interactive Voice Response (IVR) or the default extension is set to provide assistance for incoming calls that cannot be directly routed. See Configuring Port Call Policies on page 108 for information about configuring routing for incoming calls.
- Make sure that the endpoint on the LAN that is designated to process incoming calls that require assistance is registered with the gatekeeper and the Gateway.
- Make sure that the PRI or BRI numbers are properly configured in the Gateway.

Symptom Why are direct-dial calls not reaching the intended endpoint and why is the IVR not invoked?

Possible Cause The endpoint of the call recipient might not be registered with a gatekeeper or the telephone line is not working properly.

Recommended Action

- For PRI or BRI ports, make sure that the DID number is associated with an endpoint registered with a gatekeeper and that the number is included in the registration profile of the endpoint. Incoming calls the Gateway receives for unused BRI or PRI phone numbers are disconnected.
- Make sure that the BRI or PRI line is in working order.
- Disconnect the BRI or PRI line from the Gateway and connect it to a regular PSTN phone. Dial the number. If the phone does not ring, the DID line is out of order.

Possible Cause There is a mismatch between the number of digits in the dial number that the service provider sends in DID calls and the number of digits in the corresponding E.164 addresses registered with the gatekeeper.

Recommended Action Make sure that the service provider is sending the same number of digits in calls as specified for the DID service.

Make sure that the service provider is sending the same number of digits in calls as specified for the DID service.

For example, if the service specifies four significant digits in the number, the service provider must send four-digit numbers. If the service specifies seven significant digits in the number, the service provider must sends seven-digit numbers.

Symptom When TCS4 is used, why do TCS4 calls not reach the requested terminal?

Possible Cause The TCS4 number might not be registered with the gatekeeper or the Gateway is improperly configured.

Recommended Action

- Make sure that theTCS4 number is associated with an endpoint in the gatekeeper registration table.
- Make sure that the TCS4 option is enabled for the PRI or BRI port. See Configuring Port Call Policies on page 108 for information about configuring routing for incoming calls.

Symptom Why is the IVR not responding to incoming calls?

Possible Cause Endpoints placing calls to the Gateway must support DTMF to use the internal IVR. If the dialing endpoint does not support Dual Tone Multi-Frequency (DTMF) tones, the IVR forwards the call to the IVR operator or default extension operator if one is defined (see Configuring Port Call Policies on page 108 for more information).

When the volume of the DTMF tones generated by the dialing endpoint is low, the IVR might not recognize one or more of the tones. If the Gateway does not find an endpoint with a phone number corresponding to the tones dialed, the IVR treats this string as an incorrect number and disconnects the call.

Recommended Action

- Make sure that the parameter that allows the Gateway to accept DTMF for incoming calls is enabled. See Configuring IVR Settings on page 55 for information about how to set the IVR parameter.
- Make sure that the dialing terminal supports DTMF tones.
- Make sure that the DTMF tones generated are loud enough.
- Make sure that the IVR operator number is associated with the endpoint that is registered with the gatekeeper.

Monitoring from a Remote Site

You can use the Gateway interface to monitor Gateway functions from a remote site. The LEDs on the Gateway front and rear panels are replicated in the **LED Monitoring** section of the Gateway **Device** interface. You can access this page from any computer on the LAN and monitor the module for connectivity or communication problems.

Procedure

1. Launch a Java-based web browser.
2. In the address or URL field, enter the IP address of the Gateway that you want to monitor.

   The Gateway interface appears.
3. In the **User Name** field, enter a valid user name.
4. In the **Password** field, enter the user password.

   The Gateway **Settings** page appears.
5. On the sidebar, click **Device**.
6. Click the **LED Monitoring** tab (if not already selected).

   The **LED Monitoring** tab appears.

Using the Hyperterminal Configuration Commands

This section describes configuration commands that you can access through the Gateway serial port. You can use some of these commands to set device parameters that are unavailable in the Gateway interface. This section describes how to use the hyperterminal do the following:

- Accessing Device Commands through the Serial Port on page 135
- Changing a Global User Name and Password on page 137
- Setting Echo Cancellation on page 137
- Configuring the Web Server Port on page 138
- Setting T.120 Data Collaboration Capability on page 138
- Restoring the Factory Default Settings on page 139
- Configuring the Ethernet Port on page 139

Accessing Device Commands through the Serial Port

You can access device commands through the Gateway serial port. You can use these commands to configure networking information, set factory defaults, or configure Ethernet port settings.

Procedure

1. Connect the appropriate ends of the terminal cable to the serial port on the computer and the serial port on the Gateway.

Note The terminal cable is a null cable that is shipped with the Gateway module.

2. Launch the terminal emulator on the computer.
3. Set the communication values for the terminal emulator as follows:
   - Baud rate: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None
4. After the terminal emulator session starts, press the **RST** button on the Gateway front panel, or click the **Reset** button on the toolbar of the **LED Monitoring** tab of the Gateway **Device** interface.

   A log of the auto-boot events appears.
5. When the message “Press any key to start configuration” appears on the screen, press any key within 6 seconds.

   The following command line options appear.
   - Enter <N> to configure default network port values
   - Enter <P> to change the configuration software password
   - Enter <A> to display advanced configuration menu
   - Enter <Q> to quit configuration menu and start the Gateway
6. Select an option to execute.

Changing a Global User Name and Password

Several applications use the same global user name and password to log in to the Gateway. These applications include the Upgrade Utility that allows you to change the Gateway software, the Upload Utility that allows you to change the IVR messages, and the Telnet utility that allows you to monitor the Gateway operations. This user name and password are also used to log in to the Gateway interface. A newly-added administrator automatically has access to these utilities.

Procedure

1. At the prompt for the command line options, press **P** to change the software password and then press **Enter**.
2. At the Enter user name prompt, enter the name that you want to use and then press **Enter**. The user name is case sensitive.
3. At the Enter new password prompt, enter the password that you want to use and then press **Enter**. The password is case sensitive.

   A message appears verifying that the password is changed and the command line options appear.
4. Enter **Q** to continue the Gateway module boot cycle and then press **Enter**.

Setting Echo Cancellation

You can use these advanced commands to set echo cancellation for the Gateway. To set echo cancellation, perform the following steps:

Procedure

1. At the prompt for the command line options, press **A** to display the advanced command menu.
2. Press **1** to enable or disable echo cancellation for voice-only calls and then press **Enter**.
3. At the "0/1-disable/enable echo cancellation (voice calls)" prompt, do one of the following:
   - Press **0** to disable echo cancellation.
   - Press **1** to enable echo cancellation.
4. Press **Enter**.

Configuring the Web Server Port

You can set the port number that the Gateway uses for posting its web pages. The default value is 80, which is the standard for web server ports. If another port is used in your environment, you can use this command to change the Gateway module web server port setting.

Procedure

1. At the prompt for the command line options, press **A** to display the advanced command menu.
2. Press **2** and then press **Enter** to configure the web server port.
3. At the Enter a new port number for the web server prompt, enter the value that you want to use and then press **Enter**.

Setting T.120 Data Collaboration Capability

From the command line, you can use advanced commands to set the T.120 data collaboration capability for the Gateway.

Procedure

1. At the prompt for the command line options, press **A** to display the advanced command menu.
2. Press **4** to enable or disable echo cancellation for voice-only calls and then press **Enter**.
3. At the 0/1-disable/enable echo cancellation (voice calls) prompt, do one of the following:
   - Press **0** to disable T.120.
   - Press **1** to enable T.120.
4. Press **Enter**.

Restoring the Factory Default Settings

You can restore the factory default settings to the Gateway from the command line.

Procedure

1. At the prompt for the command line options, press **A** to display the advanced command menu.
2. Press **5** to restore the factory defaults.
3. At the Are you sure you want to restore factory configuration? [y, n] prompt, enter **y** and then press **Enter**.

Configuring the Ethernet Port

You can use the command line commands to configure the speed of the Gateway Ethernet port.

Procedure

1. At the prompt for the command line options, press **A** to display the advanced command menu.
2. Press **6** to change the network working mode.

   A list of Ethernet configuration options appear.
3. At the Choose working mode prompt, select one of the following:
   - Press **1** to configure the Gateway for half-duplex operation.
   - Press **2** to configure the Gateway for full-duplex operation.
   - Press **3** to configure the Gateway to negotiate the working mode with the router or switch. This is the default setting.
   - Press any other key to return to the main menu without making changes.
4. Press **Enter**.
5. At the Choose Speed working mode prompt, select one of the following:
   - Press **1** to configure the Gateway to support 100 Mbps Ethernet speed.

- Press **2** to configure the Gateway to support 10 Mbps Ethernet speed.
- Press **3** to allow the Gateway module to negotiate the Ethernet speed with the router or switch. This is the default setting.
- Press any other key to return to the configuration menu without changing the setting.

6 Press **Enter**.

6

USING THE AETHRA AUDIO MESSAGE UTILITY

This section describes the Aethra Audio Message Utility, and includes the following topics:

- Introduction
- About Gateway Call Routing
- Launching the Utility
- Playing a Message
- Recording a Message
- Replacing a Message
- Uploading a Message to a Device
- Viewing Message Details
- Exiting the Utility
- About Express Setup
- Using Express Setup

INTRODUCTION

The Aethra Audio Message Utility is an interactive GUI that enables you to record and replace messages and upload new messages to the call routing mechanisms in Aethra devices.

Each Aethra device has a built-in set of audio messages. The default messages are in English. The Aethra Audio Message Utility allows you to record new messages in a different language or with different content to suit your requirements. The Aethra Audio Message Utility also enables you to replace and upload new messages to the target Aethra device.

There are two ways of using the Aethra Audio Message Utility. The standard utility functions enable you to play, record or replace messages. The Express Setup guides you through the recording, replacing and upload procedure for each of the voice messages.

Before You Begin

Before you can record, play and upload messages to the target Aethra device, you must

- Save recorded messages as WAV files.
- Know the IP address of the target device.

ABOUT GATEWAY CALL ROUTING

The Aethra Audio Message Utility provides audio messages for the call routing mechanism in Aethra Gateways. The call routing mechanism initiates a series of voice messages that allow you to make choices and respond via the keypad through dial tones (DTMF).

The routing mechanism enables you to dial through the Aethra Gateway to an IP network-based H.323/SIP/RTSP terminal when you do not know the extension number of the destination terminal.

LAUNCHING THE UTILITY

This section describes how to install and launch the Aethra Audio Message Utility.

Procedure

1. Download the *Setup.exe* file from the distribution CD.
2. Launch the utility from the **Start** menu by selecting **Programs** and clicking **Audio Message Utility**.

PLAYING A MESSAGE

This section describes how to play an audio message. Available messages depend upon the device selected in the **Target Type** field.

Note The devices available in the **Target Type** drop-down list vary according to the Aethra devices included in your installation.

GATEWAY VERSION 5.0 MESSAGES

The following messages are available in the Gateway:

Table 6-1 *Gateway version 5.0 Messages*

ID	Message Type	Recorded Message
0	Opening Sound	Audio signal
1	Welcome	"Thank you for calling. If you know your party's extension number, dial it now followed by the pound sign. To speak to an operator please press star."
2	Transfer To Extension	"Please hold while your call is being transferred to an operator."
3	Transfer to Operator	"Thank you. Please hold."

Procedure

1. In the **Target Type** field, choose the device that uses the message you want to play.

Note The options available in the **Target Type** drop-down list vary according to the Aethra devices included in your installation.

The **Audio Recordings** window displays the messages currently uploaded to the target device.

2. Ensure the message type you wish to play is enabled in the **Audio Recordings** window.
3. Click on the message type you wish to play in the **Audio Recordings** window.

4 From the **Message** menu, select **Play Message**.

The **Play Recording** dialog box appears. You can stop or replay the message you have selected to play.

RECORDING A MESSAGE

This section describes how to record a new audio message.

Procedure

1 From the **Message** menu, select **New Recording**.

The **New Recording** confirmation box appears and the MSsound recording utility is invoked.

Note MSsound is invoked by default. You can use any recording software that supports the WAV format.

The new message must be recorded in the following formats:

- WAV file
- G.711 (CCITT)
- µ-Law
- 8-bit
- Sampling rate 8kHz

2 Use the recording software, to record a new message and save it to the Aethra Audio Message Utility directory.

REPLACING A MESSAGE

This section describes how to replace an audio message.

Procedure

1. In the **Target Type** field, choose the device that uses the message you want to replace.

Note The options available in the **Target Type** drop-down list vary according to the Aethra devices included in your installation.

2. The **Audio Recordings** window displays the messages currently uploaded to the target device. Click the message type in the **Audio Recordings** window you wish to replace.
3. From the **Message** menu, select **Properties**.

   The **Properties** dialog box appears showing the name of the message you selected in the **Message Type** field.
4. (Optional) Enter the text that you want to appear in the **Message Type** field in the **Audio Recordings** window.
5. Click the **Browse** button to choose the new message you wish to use.

   The **Replace Recording** dialog box appears.
6. Select the file with which you wish to replace the current message and click **Open** to confirm your selection.
7. Click **OK** in the **Properties** dialog box.
8. The new message appears in the **Audio Recordings** window.

Uploading a Message to a Device

This section describes how to upload audio messages from the Audio Message Utility to a target device.

Procedure

1. From the **Actions** menu, select **Upload Messages To Target**.

   The **Upload** dialog box appears.
2. In the **General Information** section, enter the IP address of the target device.
3. In the **Login Information** section, enter the user name and password of the target device, as configured in the device network configuration settings.
4. (Optional) Modify the read and write community settings for the target device as follows:
   - Click the **Customize SNMP Settings** button.

     The **Customize SNMP Settings** dialog box displays.
   - Enter the required read community and write community values and click **OK**.
5. Click the **Upload Messages** button.

   The **Upload in progress** window appears, and the message files are uploaded and burned onto the target device.

Viewing Message Details

You can view the file name and length of the audio messages listed in the **Audio Recordings** window.

Procedure

1. Click the **Target Type** drop-down list.
2. Choose the device that uses the message you want to replace.

Note The options available in the **Target Type** drop-down list vary according to the Aethra devices included in your installation.

The names of audio message files currently uploaded to the target device appear in the **Recorded Message** field of the **Audio Recordings** window.

The lengths of audio message files currently uploaded to the target device appear in the **Message Length (sec)** field of the **Audio Recordings** window.

Exiting the Utility

This section describes how to exit the Audio Message Utility.

Procedure

1. Open the **Actions** menu.
2. Select **Exit**.

About Express Setup

The Express Setup is an alternative way of recording, replacing and uploading messages. The Express Setup guides you through the recording, replacing and uploading procedure for each audio message.

You proceed through the Express Setup sequentially for each message type. You are alternately prompted to select to record a new message and to navigate a path to a new message file with which you wish to replace a current file.

As you proceed through the Express Setup, the dialog box displays the name the current message type and the associated message file.

Note You can skip the recording and replacing sequence for each message by clicking **Next** at each step in the Express Setup. You can return to any step in the procedure to change the setup for a particular message by clicking **Back**.

USING EXPRESS SETUP

This section describes how to use the Express Setup.

Procedure

1. Click **Express Setup** in the **Tools** menu.

   The **Express Setup** dialog box is displayed informing you of the name of the first message file in the selection and provides a check box for indicating whether you wish to create a new recording for the message.
2. Check the **Create a new recording** check box and click **Next**.

   The **Express Setup** dialog box displays the required format settings for the new message and the MSsound recorder is displayed. Use the MSsound recorder or other recording software to record the new message and save it to the Audio Message Utility directory.
3. When you have finished recording a new message, click **Next**.

   The **Express Setup** dialog box displays the path of the current file for the specified message type and the **Replace** button.
4. Click **Replace**.

   The **Replace Recording** window appears showing the directory containing the current sound files for the device.
5. Select the required file and click **Open** to replace this file with the current message file for the specified message.

   When you have completed the recording and replacement procedure, the **Express Setup** dialog box displays the new list of message types and message files associated with each type.
6. Click **Upload**.

   The **Upload** dialog box appears.

7 Type the IP address of the target device.

8 Type the user name and password as defined in the network configuration settings of the Aethra device.

9 Click the **Upload Messages** button to complete the upload procedure.

The **Upload in progress** window displays. The message files are uploaded and burned onto the target device.

7

USING THE AETHRA SOFTWARE UPGRADE UTILITY

This section describes the Aethra Software Upgrade Utility, and includes the following topics:

- Introduction
- Launching the Utility
- Upgrading Device Software

INTRODUCTION

The Aethra Software Upgrade Utility is an interactive GUI interface that enables you to upgrade Aethra software installed on Aethra devices.

The Aethra Software Upgrade Utility enables you to select files to be uploaded via a network or modem connection to the Aethra device. You can select either to perform a typical upgrade which includes all the new files or a customized upgrade which enables you to select which files to upload.

The upgrade files are uploaded and then burned into the memory of the Aethra device.

Before You Begin

Aethra devices automatically save configuration settings before a software upgrade takes place. However, it is recommended that you save all configuration information using the **Export** button in the Aethra device web interface toolbar. You can retrieve all these settings after the software upgrade is complete by using the **Import** button in the Aethra device web interface toolbar.

LAUNCHING THE UTILITY

This section describes how to install and launch the Aethra Software Upgrade Utility.

Procedure

1. From the network, locate the self-extracting executable file.
2. Double click the self-extracting executable file to run the Software Upgrade Utility.

   The upgrade files are extracted and the **Upgrade Utility** dialog box appears.

UPGRADING DEVICE SOFTWARE

This section describes how to use the Software Upgrade Utility to upgrade Aethra software installed on Aethra devices.

Procedure

1. In the **General Information** section of the **Upgrade Utility** dialog box, enter the IP address of the device you want to upgrade.
2. In the **Login Information** section, enter the administrator user name and password for the target device, as configured in the device network configuration settings.
3. (Optional) Modify the read and write community settings for the target device as follows:
   - Click the **Customize SNMP Settings** button.

     The **Customize SNMP Settings** dialog box displays.
   - Enter the required read community and write community values.

Note We recommend that you modify the default settings for security purposes.

   - Click **OK** to return to the **Upgrade Utility** dialog box.
4. (Optional) Select the components of the target device you want to upgrade as follows:

- Click the **Customize** button.

  The **Customize** dialog box appears.
- Check the device components you want to upgrade in the **Select the components you want to upgrade** list.

Note The components displayed vary according to the Aethra device upgraded.

- Click **OK** to return to the **Upgrade Utility** dialog box.

5 Click the **Upgrade** button to upgrade all components of the Aethra device software (or only those components you manually selected via the **Customize** option).

The Aethra Software Upgrade Utility informs you whether or not the upgrade is successful.

Note When the upgrade is complete, the Aethra device automatically resets itself and starts operation with the new software version.

8

CABLE CONNECTIONS AND PIN-OUTS

This section describes the pin-to-pin and pin-out configurations of the connectors and cables of the Aethra Gateway unit, including the following topics:

- Unit RS-232 9-Pin Serial Port
- RJ-45 8-Pin IP Network Port
- RJ-45 Serial Port Adapter Cable
- ISDN Port

UNIT RS-232 9-PIN SERIAL PORT

Table 8-1 describes the Aethra Gateway unit RS-232 9-pin D-type serial port pin-out configuration.

Table 8-1 *RS-232 9-pin D-Type Serial Port Pin-out*

Pin	Function	I/O
1	NC	
2	RXD	Input
3	TXD	Output
4	NC	
5	GND	
6	NC	
7	NC	
8	NC	
9	NC	

RJ-45 8-Pin IP Network Port

Table 8-2 describes the pin-out configuration of the RJ-45 IP network port.

Table 8-2 *Pin-out Configuration of the RJ-45 IP Network Port*

Pin	Function	I/O
1	TXD+	Output
2	TXD+	Output
3	RXD+	Input
4	NC	
5	NC	
6	RXD-	Input
7	NC	
8	NC	

RJ-45 Serial Port Adapter Cable

Table 8-3 describes the pin-to-pin configuration of the RJ-45 to DB-9 adapter cable used to connect a PC terminal to the RJ-45 serial port. This cable is provided with the Aethra Gateway unit.

Table 8-3 *Pin-to-Pin Configuration of the RJ-45 to DB-9 Adapter Cable*

RJ-45 (Male)	DB-9 (Female)	Function
1	NC	
2	NC	
3	3	TXD
4	NC	
5	5	GND
6	2	RXD
7	NC	
8	NC	

ISDN PORT

Table 8-4 describes the ISDN port RJ-45 connector pin-out configuration.

Table 8-4 *ISDN Port RJ-45 Connector Pin-out*

Pin	Function
1	RXD +
2	RXD -
3	NC
4	TXD +
5	TXD -
6	NC
7	NC
8	NC

9

TECHNICAL SPECIFICATIONS

This section provides technical specifications for the Aethra Gateway unit.

TECHNICAL SPECIFICATIONS TABLE

Table 9-1 *Aethra Gateway Unit Technical Specifications*

Unit Dimensions	■ Height: 1U (1.75 inches or 44.45 mm) ■ Width: 17.25 inches (438.15 mm) ■ Depth: 10 inches (254 mm) ■ Weight: 4.45 kg (9.81 lbs)—may vary according to configuration
LED Indicators	

Front panel	■ ETHERNET:
	  □ Link
	  □ Connection Speed
	■ GK
	■ D-Ch
	■ ALRM
	■ ACT

Rear panel (Aethra P20)	■ ACT ■ D-Ch ■ ALRM
Rear panel (Aethra B40)	■ ACT 1 to 4

Table 9-1 Aethra Gateway Unit Technical Specifications (continued)

Push Buttons	■ RST (front panel)
Communication Interfaces	
Front panel	■ Ethernet 10/100 Mbps auto-negotiate speed select ■ Asynchronous serial port RS-232 connected via 9-pin D-type connector ■ RJ-45 serial port (for video processing module) ■ SVGA port (for video processing module) ■ USB connector (for video processing module)
Rear panel (Aethra P20)	■ 2 x ISDN E1/T1 PRI port: □ T1 mode Channels: 23B + 1D Clock rate: 1.544 Mbps Framing: F4, F12, ESF no CRC, ESF, F72 Encoding: NRZ, AMI-B7, B8ZS Line impedance: 100Ω □ E1 mode Channels: 30B + 1D Clock rate: 2.048 Mbps Framing: Double framing, CRC4, Extended CRC4 Encoding: NRZ, CMI, AMI, HDB3 Line impedance: 120Ω
Rear panel (Aethra B40)	■ 4 x ISDN BRI ports
Chipset	■ PowerPC MPC755 32-bit RISC microprocessor running at 400MHz or more ■ MPC8260 secondary microprocessor running at 200/133MHz or more
Operating System	■ RTOS, VxWorks 5.4

Table 9-1 Aethra Gateway Unit Technical Specifications (continued)

Memory	■ 32 MB on-board flash memory for field upgrades, supports up to 64 MB ■ 1 MB L-2 Cache at 200 MHz or more ■ 128 MB SDRAM, supports up to 256 MB
Failsafe	■ Watchdog timer built in
Power Supply	■ Input 100-240VAC autoswitched ■ Output + 3.3VDC, + 5VDC, + 12VDC ■ Maximum power load 150W

10

COMPLIANCE AND CERTIFICATIONS

This section provides certifications that have been approved for the Aethra Gateway, including the following topics:

- Safety Compliance
- EMC
- Telecom
- Environment

SAFETY COMPLIANCE

This section lists the safety standards supported by the Aethra Gateway unit.

- UL 60950: 2000
- CAN/CSA C22.2 No. 60950-00
- GS Approval (EN 60950: 2000)
- EN 60950: 2000
- ACA TS001-1997
- AS/NZS 3260: 1993, A4: 1997
- AS/NZS 60950: 2000
- IEC 60950: 1999 (CB test report)

EMC

This section lists the EMC compliance for the Aethra Gateway unit.

- FCC Part 15, Subpart B, Class A
- ICES-003
- EN 55022: 1998, Class A
- EN 55024: 1998

- EN 61000-3-2: 1995, Amendment A14: 2000
- EN 61000-3-3: 1995
- IEC 61000-4-2: 1995
- IEC 61000-4-3: 1995
- IEC 61000-4-4: 1995
- IEC 61000-4-5: 1995
- IEC 61000-4-6: 1996
- IEC 61000-4-8: 1993
- IEC 61000-4-11: 1994
- AS/NZS 3548: 1995, Class A, Amendment 1: 1997, Amendment 2: 1997

Warning This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC PART 15 NOTICE

This section provides RF interference information for the user.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at one's own expense.

Warning Changes or modifications to the device that are not approved by the party responsible for compliance could void the user's authority to operate the equipment.

TELECOM

This section lists standards compliance for products that connect to ISDN lines.

- ACTA Part 68
- Industry Canada
- CE CTR3, CE CTR4

ACTA PART 68 NOTICE

1. This equipment complies with ACTA Part 68. On the cover of this equipment is a label that contains, among other information, the ACTA registration number. If requested, this information must be provided to the telephone company.
2. Applicable registration jack USOCs (Universal Service Order Codes) for the equipment is RJ48C for PRI interfaces and RJ49C for BRI interfaces.
3. An FCC compliant telephone cord and modular plug is provided with equipment. This equipment is designated to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See Installation Instructions for details.
4. If the terminal equipment Aethra Gateway causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
5. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.
6. If trouble is experienced with the Aethra Gateway equipment, please contact Aethra SpA customer support at (+39) 0712189900 for information on service or repairs. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.
7. The Facility Interface Codes are: 04DU9-BN; 04DU9-DN; 04DU9-1SN. The Service Order Code is: 6.0N.

8 Only Aethra SpA qualified service personnel may repair the equipment.

INDUSTRY CANADA

The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The IC does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations.

Repairs to some certified equipment should be made by an authorized maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the ground connections of the power utility, telephone lines and internal metallic water pipe system, are connected together. This precaution may be particularly important in rural areas.

The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Warning Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

ENVIRONMENT

Aethra complies with the following EU Directives:

- Restrictions on the Use of Hazardous Substances (RoHS) Directive 2002/95/EC
- Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

11

SAFETY

This section describes safety procedures and requirements for operating the Aethra Gateway, including the following topics:

- Electrical Safety
- ESD Procedures

ELECTRICAL SAFETY

To avoid an electric shock or damage to the Aethra Gateway unit, servicing should be performed by qualified service personnel only.

To reduce the risk of damaging power surges, Aethra recommends installing an AC surge arrestor in the AC outlet from which the Aethra Gateway unit is powered.

Warning Do not attempt to open the Aethra Gateway unit.

Warning Changes or modifications to the device that are not approved by the party responsible for compliance could void the user's authority to operate the equipment.

GROUNDING

The power cable of the Aethra Gateway unit should only be connected to a power outlet that has a protective earth contact. Do not use an extension cord that does not have a protective conductor (ground). The Aethra Gateway unit can become dangerous if you interrupt any of the protective conductors (grounding) or disconnect any of the protective earth terminals.

HIGH VOLTAGE

Disconnect the Aethra Gateway unit from the power line before removing the cover. Avoid any adjustment, maintenance, or repair of an opened chassis under voltage. These actions should only be carried out by a skilled person who is aware of the dangers involved. Capacitors inside the chassis may still be charged, even if the unit has been disconnected from the power source.

ESD PROCEDURES

To prevent damage to the Aethra Gateway unit by random electrostatic discharge (ESD), the use of wrist straps is highly recommended.

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